CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER NO. 00-043
UPDATED WASTE DISCHARGE REQUIREMENTS AND RESCISSION OF ORDERS 90-146, 91-098, 92-010, 92-092, 93-016 AND 93-109 FOR:
CHEVRON PRODUCTS COMPANY, RICHMOND REFINERY
RICHMOND, CONTRA COSTA COUNTY

The California Regional Water Quality Control Board, San Francisco Bay Region, hereinafter called the Board, finds that:

SITE DESCRIPTION

1. Chevron Products Company, a subsidiary of Chevron U.S.A. Inc., (hereinafter called Chevron), owns and operates the Richmond Refinery. The refinery, built in 1902, produces a broad range of fuels, lubricants, asphalt and petrochemicals. The 2,900-acre refinery is located along the southern shore of San Pablo Bay in Contra Costa County (Figure 1). The City of Richmond lies to the east of the facility. To the east and within one mile from the facility is industrial, residential, commercial and agricultural land use. Certain wastes generated from the refinery's processes have historically been deposited at various locations within the refinery.

PURPOSE OF ORDER

2. This Order updates and consolidates the requirements for continued maintenance and monitoring of inactive and closed waste management units, along with refinery-wide groundwater corrective action measures, into a single document. This Order also requires leak detection monitoring systems for above-ground petroleum storage tanks, reporting of petroleum hydrocarbon spills to permeable ground surfaces, documenting cleanup of petroleum spills, and recovering free-phase petroleum from the water table wherever practicable.

RELATED ORDERS

3. Prior to this Order, the Board regulated refinery-wide groundwater corrective action under Waste Discharge Requirements Order No. 93-109.

   Other Orders adopted for the refinery are:

93-016	Site Cleanup Requirements for the S.P. Hill Tankfield;
92-111	NPDES permit for the refinery's discharge of treated process water and untreated segregated stormwater;
92-092	Site Cleanup Requirements for the Alkane Sector;

92-010 Waste Discharge Requirements for Landfill 15;
91-098 Cease and Desist Order for Pollard Pond and the Hydropits; and
90-146 Site Cleanup Requirements for Plant 1/Additives Plant.

Reference To Regulations

4. Effective July 18, 1997 many provisions of the California Code of Regulations (CCR) for non-hazardous waste were moved from Division 3, Chapter 15 into Title 27, Division 2 (Title 27). Where applicable the new regulatory citations have been incorporated in this Order.

HYDROGEOLOGIC SETTING

5. The Richmond Refinery and its appurtenant tankfields are located on the peninsula of the Potrero-San Pablo Ridge, which is composed of steeply dipping Franciscan Complex. The refining of the petroleum products generally occurs on the bay fill areas northeast of the ridge. The southwest side of the ridge consists of steep topography wherein the Franciscan Complex has been terraced for the placement of above ground petroleum storage tanks.

6. Past fluctuations in sea level created a complex sedimentary sequence of interfingered estuarine and alluvial fan deposits overlying the Franciscan Complex bedrock. The uppermost deposits are artificially placed bay fill, ranging from approximately 3 feet to approximately 30 feet in depth. The fill materials overlie bay muds which consist of silt and silty clay with abundant plant matter or peat. The bay muds overlap onto the Franciscan bedrock and thicken bayward.

7. Three hydrogeologic zones have been identified within the top 150 feet of sediments in the flat lying areas of the site, the A-Zone, C-Zone and the B-Zone, in order of increasing depth. The A-Zone is the first water bearing zone and consists of artificial fill and the naturally occurring peat rich, bay mud. The water table elevation for this zone is within two to ten feet of the ground surface and generally discharges to the Bay.

8. The C-Zone is an 80 to 90-foot-thick water bearing zone of interfingered alluvial and estuarine sediments. These sediments generally have low hydraulic conductivity, but sandy, more permeable units occur as channels and lenses. The sand units have not been shown to be contiguous across the site, but do appear to be hydraulically connected. However, based on 13 years of chemical data there is no indication that the C-Zone groundwater has been significantly impacted. Chevron has concluded that the bay mud has been an effective hydraulic barrier between the A- and C-Zones and has prevented the migration of contaminants in groundwater from the A-Zone to the C-Zone. These results and conclusions were presented to the RWQCB in two reports titled, C-Zone Investigation - Phase 1 and Phase 2, dated February 8, 1991 and December 20, 1991 respectively and continue to be supported by groundwater monitoring data collected pursuant to the refinery-wide Self-Monitoring Program.

9. The B-Zone is a relatively permeable unit at approximately 100 feet below the ground surface. It ranges from 5 to 15 feet thick and contains potable water, but has limited production capacity. The B-Zone occurs under artesian conditions and appears to be hydraulically separate from the overlying zones.

10. As shown in Figure 2, the refinery lies in four geomorphic/geologic settings referred to locally as the "Alluvial," "Flats," "Ridge," and "Transition" Zones.

    a. The **Alluvial Zone** is defined as the broad area of alluvial fan deposits, derived from the Berkeley Hills, east of the Refinery. This zone represents flatland areas in which Bay Mud was not deposited. The upper portion of the alluvial fan deposit is typically clayey with low permeability.

    b. The **Flats Zone** comprises the flatland marsh area bounded by San Pablo Bay to the north and extending south along the northeast side of Potrero-San Pablo Ridge. For the purpose of the Refinery's investigations, the inland Flats Zone/Alluvial Zone boundary has been defined to be the 5-foot Bay Mud isopach (line of equal thickness). Thus, the Flats Zone is typically underlain by at least five feet of Bay Mud except where removed by excavation or erosion, in local areas of non-deposition, or where displaced by differential settlement of overlying fill.

    c. The **Ridge Zone** consists primarily of colluvium (slope wash) overlying deformed Franciscan Complex rocks exposed along Potrero-San Pablo Ridge. The boundary of the Ridge Zone is defined as those areas of Potrero-San Pablo Ridge above the 50-foot elevation contour.

    d. The **Transition Zone** is defined as the area that separates the Flats Zone from the Ridge Zones. As described above, the Flats-Transition boundary is defined as the 5-foot Bay Mud isopach and the Ridge-Transition boundary is defined as the 50-foot elevation contour.

CORRECTIVE ACTION

11. Chevron has implemented a corrective action program described in the report "Groundwater Protection System (GPS) Engineering Report" dated December 20, 1991 for the interception of contaminated groundwater from the facility prior to entering San Pablo Bay. The GPS is intended to be a hydraulic control measure composed of a varying combination of slurry wall, extraction trench and/or extraction wells. Groundwater extraction through the trenches and/or wells establishes and maintains a contiguous capture zone which prevents migration of potentially contaminated A-Zone groundwater past the GPS alignment. The slurry wall was installed where thick and/or highly permeable intervals of A-Zone fill soils are encountered. A low permeability Bay Mud "floor" inhibits transport of A-Zone contaminants to the underlying C-Zone in the "Flats Zone" of the Refinery, (see Figure 3).

12. The Board, in Waste Discharge Requirements Order 93-109, determined that the GPS is a satisfactory corrective action measure for the containment and removal of contaminated groundwater along the perimeter of the facility adjacent to San Pablo Bay. In addition, Chevron will remediate any contamination at discrete sites within the facility according to a Free-Phase Hydrocarbon Recovery Plan and a Soils Management Plan, both of which are to be submitted pursuant to Provisions C.5 & C.7 of this Order, thereby maximizing the efficiency of the GPS as a corrective action.

13. Approximately 24,700 linear feet of extraction trench, 15,185 linear feet of barrier wall, 200 extraction locations, and one groundwater treatment plant have been installed and are operating as of the first quarter of 2000. The extracted groundwater is routed to the refinery's effluent treatment system and discharged in accordance with existing NPDES permit requirements.

WATER QUALITY PROTECTION STANDARDS

14. Title 27 of the California Code of Regulations requires the RWQCB to establish a Water Quality Protection Standard (WQPS) in a Waste Discharge Requirements order for each waste management unit covered by that order. The four components of the WQPS are as follows:

    a. Constituents of Concern
    The Constituents of Concern (COCs) for groundwater are listed in Table 2 of the attached Self-Monitoring Program. Monitoring parameters (MPs), a subset of the COCs, are typically the most mobile and commonly detected COCs in groundwater at the site and are measured on a more frequent basis than the entire list of COCs. During a corrective action period, monitoring parameters provide a means to evaluate the effectiveness of the corrective action.

    b. Concentration Limits
    Maximum Allowable Concentration Limits (MACLs) have been established for each COC listed in Table 2 of the Self-Monitoring Program. Due to the number of releases over the past 98 years of refinery operations, it may be technologically and/or economically infeasible to cleanup all petroleum refining-related constituents in the groundwater to background concentrations (non-detect for synthetic organics). The MACLs were thus developed to protect the beneficial uses of shallow groundwater beneath the refinery (see Findings 26 to 28 – Beneficial Uses). The applicable beneficial uses with the most stringent water quality objectives are related to shallow groundwater discharge to surface waters of San Francisco Bay and include uses involving the health of aquatic organism receptors in the Bay and humans who consume aquatic organisms from the Bay.

    c. Point of Compliance
    Title 27 defines the Point of Compliance as the "vertical surface located at the hydraulically downgradient limit of the Unit that extends through the uppermost

aquifer underlying the Unit." The appropriate Point of Compliance for the refinery, based on the areal extent of groundwater impacts and the large number of waste management units (WMUs) involved, is the GPS extraction trench/barrier wall system, which maintains a hydraulic capture zone to protect sensitive ecological receptors in the Bay and wetlands adjacent to the refinery. The GPS/POC boundary was established under the following guidelines: 1) at the downgradient perimeters of individual WMUs which require corrective action but are non-contiguous with other "A-Zone" areas under corrective action (e.g. Pollard Pond, Parr-Richmond site); 2) at the furthest downgradient boundary common to a group of WMUs and/or areas under corrective action (e.g. Landfarm 2-5, Plant 1/Additives Plant); or, 3) at the refinery shoreline boundary where "A-Zone" groundwater contamination not associated with specific WMUs is present.

d. Monitoring Points
Monitoring points for compliance with the refinery-wide corrective action program are shown in Table 1 of the attached Self-Monitoring Program. These monitoring points generally consist of shallow groundwater monitoring wells located downgradient of the GPS extraction well capture zone. Because refinery operations predate collection of groundwater chemistry data, background water quality monitoring locations do not exist at this site; therefore, intra-well statistical comparisons will be used for evaluating trends in concentrations of COCs detected in groundwater monitoring wells. Concentrations of petroleum hydrocarbon related COCs reported above MACLs are expected to exhibit decreasing trends over time as the GPS continues to operate and natural biodegradation processes take place.

REFINERY SECTORS

15. In order to provide phased implementation of the GPS and remediation goals, Chevron subdivided the facility into nine geographic sectors, plus the former Pollard Pond, (see Figure 4). Each sector has unique hydrogeology and varying degrees of environmental concern. The sectors are as follows:

- Landfarms/Landfills Sector
- Castro Sector
- Main Yard Sector
- North Yard Sector
- Bayside Sector - North
- Bayside Sector - South
- Alkane Sector
- Effluent Sector
- Reclamation Sector
- Former Pollard Pond

16. Sector boundaries are generally defined by a physiographic boundary separating adjacent sectors, or by the refinery property line. The upgradient sector boundaries for the Alkane,

North Yard, and Main Yard Sectors correspond to an inferred groundwater drainage divide, which is generally coincident with topographic drainage divides along San Pablo Ridge. The upgradient sector boundaries for the Landfarms/Landfills, Castro, and Reclamation Sectors are generally coincident with the Refinery property line. The Bayside Sector (North and South) includes all Chevron properties on the southwestern side of San Pablo Ridge and adjacent to San Francisco Bay. With the exception of the Bayside Sector, all sites described in this Order are upgradient of the GPS.

SUMMARY OF CLOSURE ACTIVITIES COMPLETED PURSUANT TO RELATED ORDERS

The following is a summary of actions taken pursuant to RWQCB orders. All of the following orders will be rescinded and the remaining open items incorporated into this revised site-wide order.

17. Order No. 90-146: Site Cleanup Requirements for Plant 1/Additives Plant

Order No. 90-146 established a remedial action schedule for Chevron Chemical Company's former Plant 1 and Chevron USA's former Additives Plant located adjacent to each other in the southeastern corner of the refinery along Castro Street (Figure 5). Between 1930 and 1970 Plant 1 was used for pesticide formulating and packaging and the Additives Plant was used for gasoline additives manufacturing. As a result, soil is contaminated with pesticides, lead and petroleum hydrocarbons. Hazardous levels of chlordane, DDT and soluble lead have been detected in onsite soil. Corrective action completed pursuant to Order No. 90-146 included 1) installation of an extraction system for containment of contaminated shallow groundwater (GPS), and 2) covering the site with a combination of the Richmond Parkway, passing directly over a portion of the site, and placement of a geotextile and asphalt cap (or vegetated fill in some areas) over the non-roadway portions. The combined cover provides a low-permeability cap over the site and the encompassing groundwater extraction system prevents contaminated shallow groundwater from leaving the site. The Board received a report, dated December 18, 1996, documenting completion of construction, closure, and remedial operations with as-built details. Closure activities were completed in compliance with the Site Cleanup Requirements order and were consistent with approved plans. No further closure activities are necessary or required for the Plant 1/Additives Plant. Post-closure maintenance and monitoring activities are addressed in Part B of the attached Self-Monitoring Program.

18. Order No. 91-098: Revised Cease and Desist Order for Pollard Pond and the Hydrolyzing Pits

Order No. 91-098 established a compliance schedule for the closure of hazardous waste surface impoundments in two areas of the refinery under the Toxic Pits Cleanup Act (TPCA). The first impoundment, known as Pollard Pond, was a 3-acre surface impoundment located in the northwestern portion of the refinery (Figure 6) adjacent to

San Pablo Bay that contained sludges with a pH less than 2 and Bay Mud dredge spoils from the refinery yacht harbor.

The second set of impoundments, known as the Hydrolyzing Pits (Hydropits), were three small unlined surface impoundments located on the shore of San Pablo Bay in the Alkane Sector (Figure 7) that historically received wastewater from the refinery's Alkane Plant until 1986. The most significant constituents of this waste stream were neutralized hydrofluoric acid, fluoride salts, and small amounts of oil containing benzene.

a. Compliance with Order 91-098 for Pollard Pond: The Board received a report, dated December 15, 1994, which documented compliance with TPCA cease discharge requirements and closure according to the Revised Closure Plan approved by the Executive Officer. Closure activities included removal of all low-pH hazardous wastes, installation of a GPS groundwater extraction trench at the downgradient boundary of the pond, dismantling of Pollard Dam, and confirmation sampling of soil from the bottom of the pond excavation. The results of the 16 confirmation samples showed diesel-range total petroleum hydrocarbons ranging from non-detectable at a reporting limit of 190 mg/kg to 3,874 mg/kg and pH ranging from 3.85 to 9.00.

   The remaining 30,000 cubic yards of non-hazardous hydrocarbon contaminated soils, originally identified for bioremediation in the closure plan, were removed from the site and placed in Landfill 15 as described in Addendum 3 to the Revised Landfill 15 Closure Report submitted to the RWQCB on May 22, 1996. Tasks remaining to be completed prior to RWQCB approval of final closure include evaluation and management of potential risks to human or ecological receptors that may result from remaining non-hazardous petroleum hydrocarbon contaminated soils and areas of low pH in the excavated portion of the pond. Provision C.3 of this Order requires Chevron to submit a Risk Analysis and Management Plan to address these concerns.

b. Compliance with Order No. 91-098 for the Hydropits: Chevron submitted a closure certification report for the closure of the Hydropits dated November 23, 1992. The Hydropits Closure Unit includes a multi-layer cap and the Alkane GPS. The key portions of the GPS with respect to the Hydropits are the groundwater extraction trench and slurry wall (hydraulic and physical barriers) along the northeastern perimeter of the Hydropits adjacent to Castro Cove. The unit no longer contains liquid hazardous waste and as such, meets the cease discharge requirements of TPCA. Closure activities were completed in compliance with the Cease and Desist Order and were consistent with approved plans. No further closure activities are necessary or required for the Hydropits. Post-closure maintenance and monitoring activities are addressed in Part B of the attached Self-Monitoring Program.

19. Order No. 92-010: Waste Discharge Requirements for Landfill 15

Landfill 15 is a 41-acre former tidal marsh area along the eastern border of the refinery that Chevron converted for waste disposal use (Figure 8). The site was used from the early 1960s to 1987 as an evaporation pond and as a landfill for a variety of wastes including sludges (separator, paint, and water treatment), oily soil and dredge spoils, resins, catalyst fines, lime, and sulfur. Approximately 13 acres of Landfill 15 were re-activated in 1992 for disposal of treated non-hazardous acidic sludge and dredged bay mud generated from the closure of Pollard Pond. Order No. 92-010 provided schedules and specifications for construction of improvements to Landfill 15 including installation of a downgradient slurry wall and groundwater extraction system (part of the refinery-wide GPS) to intercept and remove any mobile pollutants in the groundwater beneath the unit. Order No. 92-010 also required an evaluation of the monitoring program for the unit, regulated the quantity and type of waste to be discharged, and specified a closure date. The activated portion of the landfill which accepted the Pollard Pond closure waste was closed by placement of a multi-layer low-permeability cap. This activity was documented in the *Landfill 15 Active Unit Final Closure Status Report* dated June 29, 1995. The remaining 28 inactive acres that ceased receiving waste material prior to 1987 were capped in 1996 and 1997. Closure activities were completed in compliance with Waste Discharge Requirements and were consistent with approved plans. No further closure activities are necessary or required for Landfill 15. Post-closure maintenance and monitoring activities are addressed in Part B of the attached Self-Monitoring Program.

20. Order No. 92-092: Site Cleanup Requirements for the Alkane Sector

Order No. 92-092 required Chevron to submit corrective action and monitoring plans for the Alkane Tankfield area and for shallow groundwater plumes containing benzene, fluoride, and free-phase petroleum hydrocarbons originating from the Alkane Plant area (Figure 7). The contamination due to releases of benzene, hydrofluoric acid and liquid hydrocarbons necessitated source area remediation consisting of free product recovery and groundwater extraction and treatment in addition to implementation of the GPS to hydraulically contain shallow contaminated groundwater on the downgradient perimeter of the Alkane Plant area adjacent to San Pablo Bay.

As of the first quarter 2000, Chevron operates six extraction wells designed to recover floating liquid hydrocarbons and contaminated groundwater in the Alkane Plant plume source area upgradient of the Hydropits Closure Unit and the Alkane Sector GPS. These extraction wells and a groundwater treatment system make up the Alkane Plant Groundwater Recovery System (APGRS). Groundwater and liquid hydrocarbons recovered by the extraction wells are piped to the groundwater treatment system which separates the liquid hydrocarbons from the extracted groundwater and removes benzene from the groundwater by passing it through granular activated adsorption vessels. From the APGRS, the treated groundwater is routed to the refinery's effluent treatment system and is discharged in accordance with existing NPDES permit requirements. Tasks related to the corrective action and monitoring objectives of Order No. 92-092 that remain to be fulfilled before cleanup activities can be terminated are consolidated into this Order in Specification B.6, Provision C.4 and Part B of the attached refinery-wide revised Self-Monitoring Program.

21. Order No. 93-016: Site Cleanup Requirements for the S.P. Hill Tankfield

Order No. 93-106 requires cleanup of contaminated groundwater and removal of free-phase liquid petroleum hydrocarbons under the S.P. Hill Tankfield. The S.P. Hill Tankfield is located on the western flank of the Potrero-San Pablo Ridge in a southwest trending drainage basin (see Figure 9). During hydrogeologic investigations conducted between 1991 and 1993, free-phase petroleum hydrocarbons were discovered in 5 wells located in the central portion of the tankfield within a 250-foot radius of each other. Chevron has been recovering free product and some incidental groundwater from these wells since 1994. Free product recovery rates are generally less than one gallon per day. The primary cleanup objective as proposed in the *Free-Phase Hydrocarbon Removal Plan, S.P. Hill Tankfield* (June, 1993) is to recover as much free-phase hydrocarbon product as is technically feasible and cost-effective. Chevron also operates additional extraction wells to create a hydraulic depression and capture dissolved petroleum hydrocarbon constituents in groundwater several hundred feet downgradient of the free product recovery system. These additional wells are located in Basins 4 and 7, which act as aboveground storage tank secondary containment areas. Cleanup goals for dissolved constituents of concern in this part of the refinery are the Maximum Allowable Concentration Limits (MACLs) for the Bayside Sector – South (see Table 2 in Part B of attached Self-Monitoring Program). Gasoline and diesel range total petroleum hydrocarbons and benzene are the only constituents of concern which still exceeded the MACLs as of the fourth quarter, 1999. Tasks related to the corrective action and monitoring objectives of Order No. 93-016 that remain to be fulfilled before cleanup activities can be terminated are consolidated into this Order in Specification B.9, Provisions C.12 and C.13, and Part B of the attached refinery-wide revised Self-Monitoring Program.

22. **CORRECTIVE ACTION/CLOSURE STATUS FOR WMUS AND OTHER AREAS OF CONCERN NOT UNDER SEPARATE ORDERS**

The following table summarizes closure activities and/or corrective action work that has taken place since WDR 93-109 was adopted for units not addressed in separate orders as described above.

Area of Concern	Refinery Sector	Status/Corrective Actions Completed	Further Actions Necessary
Office Hill Tankfield	Bayside – South (Figure 9)	All but one of the aboveground petroleum storage tanks has been taken out of service and dismantled. Groundwater and soil sampling results from the 1991 Hydrogeologic Investigation did not detect significant concentrations of hydrocarbon in this area.	None
Point Orient Tankfield	Bayside – North (Figure 10)	In 1990 tanks in this area were taken out of service, dismantled, and contaminated soils removed. There is no evidence of accumulations of free-phase hydrocarbons on the water table along the perimeter of the tankfield. However, based on observations of hydrocarbon-contaminated soil beneath the former tanks, some of the tanks in this area may have leaked petroleum in the past. Chevron submitted a hydrogeologic investigation for this tankfield on June 23, 1992 which determined that minor soil and groundwater contamination exists at the No.10 Basin, which collects storm water runoff. Groundwater analysis from monitoring wells at this site show diesel contamination at concentrations of up to 3 mg/l.	Continue groundwater monitoring
Landfarms	Landfarms (Figure 8)	Between the 1970's and 1987, Chevron conducted landfarming operations at five locations within the site to promote biodegradation of oily soils that had been generated from various operations. The Landfarms have not received waste since 1987. Chevron entered into a Consent Agreement with the U.S. EPA and DTSC to close the Landfarm units (EPA Order RCRA 09-88-0005) and submitted the original *Landfarms Closure Plan* on March 31, 1988. The *Revised Landfarm Closure Plan* was submitted to DTSC on December 30, 1996 and revised on March 19, 1997. DTSC approved the Revised Landfarms Closure Plan on March 19, 1998. Closure of the Landfarms commenced in 1998 and was completed in 1999 and consisted of importing fill, grading, installation of a vegetative cap, installation of stormwater collection trenches, and installation of shallow groundwater extraction trenches. Chevron submitted the *Landfarm Closure Completion Certification Report* on September 30, 1999 and has since	Post-closure monitoring and maintenance per attached Self-Monitoring Program.

Area of Concern	Refinery Sector	Status/Corrective Actions Completed	Further Actions Necessary
		filed an application for the Post-Closure Permit.	
#1 Oxidation Pond	North Yard (Figure 11)	The No. 1 Oxidation Pond, originally constructed in 1959, was separated into five compartments (passes), for the controlled sequential movement of wastewater as a component of the effluent treatment process. Pass 1 was clean closed in 1990 and permitted as a clean stormwater impound basin. Passes 2 through 5 are currently inactive but in the past received process water and stormwater. Chevron performed sampling and analysis of the pond sludges in 1985 and 1989 as part of the Report of Waste Discharge. Since December 1998, an EPA sponsored Phytoremediation Study has been underway to evaluate the efficacy of agricultural and non-crop plants for degradation of aged petroleum hydrocarbons. In 1999, Chevron completed installation of a soil-bentonite barrier wall between the First and Second Pass of the No. 1 Oxidation Pond. This wall was constructed as part of the GPS as described in *the Groundwater Protection System Engineering Report* dated December 20, 1991.	Development of site corrective action plan. (See Provision C.8)
250 Foot Channel	Effluent (Figure 11)	The 250 Foot Channel site was excavated to –40 MSL in the early 1900's and served as the original ship channel for the refinery. The channel served as the primary NPDES discharge point from 1973 – 1987. From 1987-1994 the channel received once through non-contact cooling water and stormwater; however, treated process water effluent was no longer routed through the channel as in previous years. From 1994 to the present, the channel has acted as surge capacity for stormwater and Aggressively Biologically Treated (ABT) process water effluent. In 1998, the discharge pipes in the dam were demolished, a barrier wall was installed across dam, and a pilot remediation test was conducted. A barrier wall along the east side of the channel is scheduled for construction in 2000.	Development of corrective action for sediments in channel. (See Provision C.9)

Area of Concern	Refinery Sector	Status/Corrective Actions Completed	Further Actions Necessary
Parr-Richmond Landfill	Reclamation Phase II (Figure 12)	Chevron acquired this site in 1954 from the Parr-Richmond Industrial Corporation. The area had been previously used for agriculture grazing, municipal landfilling and various junkyard storage activities from prior to 1930 until 1954. In 1995 GPS was installed around the perimeter of the unit as documented in accordance with the *Phase II Area GPS Implementation Plan*. In 1997, the Parr Richmond cover was constructed over the former landfill area in conformance with the *Final Corrective Action Plan, Reclamation Sector, Phase II Areas, Parr-Richmond Site.* Chevron submitted the *Parr-Richmond Former Municipal Landfill Corrective Measures Certification Report* in May 1999.	On-going monitoring and maintenance per attached Self-Monitoring Program.
Gertrude Street Site	Reclamation Phase II (Figure 12)	The Gertrude site covers approximately 3 acres on the east side of the Reclamation Phase II Area. Chevron purchased the property in 1961 and continued to lease the property to Mr. J.H. Henslee who conducted auto dismantling and drum reconditioning at the site until 1983. In 1983, approximately 200 drums were removed from the site to an appropriate waste disposal site. In 1985 the surface of the site was egarded to allow for stormwater collection as described in the *Gertrude Street Site Rainwater Containment Plan*. In 1996, Chevron submitted the *Final Corrective Action Plan, Reclamation Sector, Phase II Area, Gertrude Street Site*, which provided for final cover of the site. In 1997 the final cover for the site was completed and a groundwater extraction trench was installed to prevent groundwater migration off-site. Chevron submitted the *Closure Certification Report, Gertrude Street Site* in March 1998.	On-going monitoring and maintenance per attached Self-Monitoring Program.
Salt Water Pump Station	Bayside South (Figure 9)	In 1998, a free phase hydrocarbon sheen was observed floating on the Bay near the intake flume of the former Salt Water Pump Station. The source of this hydrocarbon is believed to be from historical pipeline leaks from the adjacent pipeway. In 1999 a soil-bentonite barrier wall was constructed adjacent to the intake flume and two monitoring wells were installed upgradient of the barrier wall.	Monitor per attached Self-Monitoring Program to evaluate need for permanent

Area of Concern	Refinery Sector	Status/Corrective Actions Completed	Further Actions Necessary
			extraction system.

ABOVEGROUND PETROLEUM STORAGE TANKS

23. Aboveground petroleum storage tanks are required to comply with the requirements of Chapter 6.67 Section 25270 of the Health and Safety Code, and with Part 112, Title 40 of the Federal Code of Regulations. In part, the regulations require installation and utilization of a leak detection system for each regulated tank which has the potential to impact groundwater or surface waters. The Chevron Richmond Refinery operates approximately 197 aboveground petroleum storage tanks with a total storage capacity of 596,349,209 gallons. All but a small number of these tanks (about 40 as of the adoption date of this Order) have leak detection bottoms (LDBs). The LDB design used by Chevron, whether for a new tank or an existing tank bottom retrofit, has three basic components. From the bottom up they consist of: 1) a synthetic (usually HDPE) liner to act as a release prevention barrier, 2) a grooved concrete pad which is sloped toward a certain point, usually a sump, at the perimeter of the tank, and 3) a 0.25 inch thick welded steel bottom. The grooves in the concrete pad are intended to catch and divert any product leaking through the steel bottom to the perimeter of the tank where it can be visually observed by refinery personnel during routine inspections. It is Chevron's policy to install LDBs on all new tanks constructed at the Richmond Refinery and to retrofit old tanks with LDBs if they are kept in service after their steel bottoms need to be replaced. Chevron has been submitting an internal tank bottom integrity test schedule every two years for the tanks without LDBs. Chevron is required by Specification B.13 and Provision C.11 of this Order to continue submitting this biennial schedule and to test the tank bottoms for integrity and thickness at intervals not to exceed 10 years for tanks that have been inspected at least once under the schedule until these tanks are either retrofitted with LDBs or permanently taken out of service.

24. Aboveground petroleum storage tank facilities are required to have secondary spill containment for the capture of sudden releases from an aboveground petroleum tank. The Chevron Refinery utilizes several different types of soil berms, spill collection basins and channels located in the tank fields for containment and diversion of petroleum hydrocarbon releases. The primary regulation governing this activity is CFR 112.7 Spill Prevention Control and Countermeasure Plans (SPCC). The SPCC is designed to prevent spills at petroleum facilities to the maximum extent practicable and mitigate a spill if it occurs. The primary emphasis of the SPCC Plan is on spill prevention. Some of the spill containment areas are centrally located in the main tankfield, and because of this a large surface area may be impacted by a petroleum spill. Provision C.10 of this Order requires Chevron to submit a report that identifies tanks from which a sudden release of petroleum may impact large areas with permeable surfaces, and the steps taken to prevent a release and thus reduce the potential for groundwater degradation.

BASIN PLAN

25. The Board adopted a revised Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) on June 21, 1995. This updated and consolidated plan represents the Board's master water quality control planning document. The revised Basin Plan was approved by the State Water Resources Control Board and the Office of Administrative Law on July 20, 1995, and November 13, 1995, respectively. A summary of regulatory provisions is contained in 23CCR 3912. The Basin Plan defines beneficial uses and water quality objectives for waters of the State, including surface waters and groundwaters.

BENEFICIAL USES

26. Shallow groundwater beneath the "Flats Zone" which comprises the flatland marsh area bounded by the San Pablo Bay to the north and extending south along the northeast side of the Potrero-San Pablo Ridge has Total Dissolved Solids (TDS) that is significantly higher than the 3000 mg/l (5000 μS/cm electrical conductivity) level which the State Water Resources Control Board [State Board Resolution No. 88-63, exemption criterion 1(a)] and the Regional Water Quality Control Board (Regional Board Resolution No. 89-39) set as a maximum for a municipal or domestic water supply in the Sources of Drinking Water Policy. There is no historical, existing or planned use of groundwater as a source of drinking water in either the shallow (A- and C-Zone) or deeper (B-Zone) aquifers in this part of the refinery.

Groundwater beneath the "Ridge Zone," which is bounded on the south by San Francisco Bay and extends northwest up to the top of the Potrero-San Pablo Ridge (Bayside sectors), is primarily contained in fractured bedrock of the Franciscan Complex. Based on hydraulic conductivity data collected during hydrogeologic investigations of the tankfields in the Bayside North and Bayside South sectors, it is unlikely that a single well could produce an average sustained yield of 200 gallons per day for drinking water supply purposes [State Board Resolution No. 88-63, exemption criterion 1(c) and Regional Board Resolution No. 89-39]. There is no historical, existing or planned use of unconfined groundwater as a source of drinking water in this part of the refinery.

There is the potential, however, for groundwater on either side the Potrero-San Pablo Ridge to discharge into San Francisco and San Pablo Bays at the shoreline groundwater/surface water interface. Therefore, the surface water beneficial uses named in the Basin Plan for these bodies of water are applicable to groundwater in point-of-compliance monitoring wells near the shoreline interface.

There are no existing or potential beneficial uses of groundwater underlying the site which is less than 100 feet deep or is contained in bedrock.

The existing and potential beneficial uses of groundwater underlying the site which is not contained in bedrock and is greater than 100 feet below ground surface are:

(i) Industrial process and service supply
(ii) Agricultural water supply
(iii) Municipal and domestic supply

28. The existing and potential beneficial uses of San Francisco and San Pablo Bays are:

(i) Industrial service and process supply
(ii) Water contact and non-contact recreation
(iii) Wildlife habitat
(iv) Commercial and sport fishing
(v) Fish migration and spawning
(vi) Navigation
(vii) Estuarine habitat
(viii) Preservation of rare and endangered species

CEQA

29. This action is categorically exempt from the provisions of the California Environmental Quality Act pursuant to Section 15301, Title 14, of the California Code of Regulations.

NOTICE AND MEETING

30. The Board has notified Chevron and interested agencies and persons of its intent to revise waste discharge requirements for the discharge, and has provided them with an opportunity to submit their written comments.

The Board, at a public meeting, heard and considered all comments pertaining to this discharge.

IT IS HEREBY ORDERED that Chevron, its agents, successors and assigns shall meet the applicable provisions contained in 27CCR, Division 2, Subdivision 1 of the California Code of Regulations and Division 7 of the California Water Code, and shall comply with the following:

A. PROHIBITIONS

1. The treatment, discharge or storage of materials which may impact the beneficial uses of ground or surface water shall not be allowed to create a condition of pollution or nuisance as defined in Sections 13050 (l) and (m), respectively, of the California Water Code.

2. The discharge of additional hazardous waste at the facility is prohibited. For the purpose of this Order, the term hazardous waste is as defined in Title 23, Article 2 of Chapter 15.

3. The creation of any new waste management unit is prohibited without prior approval by the Regional Board.

4. Activities associated with subsurface investigations and cleanup that will cause significant adverse migration of pollutants are prohibited.

5. Chevron shall not cause the following conditions to exist in waters of the State at any place outside downgradient influence of the GPS extraction trench or well capture zone:

   a. Surface Waters

      Floating, suspended, or deposited macroscopic particulate matter or foam.

      Bottom deposits or aquatic growth.

      Turbidity, apparent color, or water levels beyond natural background levels.

      Visible, floating, suspended or deposited oil or other products of petroleum origin.

      Toxic or other deleterious substances in concentrations or quantities which may cause deleterious effects on aquatic biota, wildlife, or waterfowl, or which render any of these unfit for human consumption either at levels created in the receiving waters or as a result of biological concentrations.

   b. Groundwater

      Subsurface migration of pollutants associated with Chevron's operations to waters of the State is prohibited.

B. SPECIFICATIONS

1. Technical reports submitted pursuant to Provisions C.1, C.3, C.4, C.5, C.8, C.9, C.10, C.12, C.13, and C.15 of this Order shall be prepared under the supervision of and signed by a California registered engineer, registered geologist, or certified engineering geologist.

2. The site shall be protected from any washout or erosion of wastes or covering material and from inundation which could occur during a 100 year flood event. The final covers of all waste management units shall be graded and maintained to promote lateral runoff of precipitation and to prevent ponding.

3. Chevron shall maintain all devices or designed features, installed in accordance with this Order, such that they continue to operate as intended without interruption, except for limited periods of maintenance and repair, effluent system management during major storm events, or as a result of failures that could not have been reasonably foreseen or prevented by Chevron.

4. Chevron shall extract water from the Groundwater Protection System (GPS) at a rate which eliminates or reverses the bayward migration of contaminants. Chevron shall install, if practicable, a physical barrier downgradient of any extraction well(s) or extraction trenches that are producing Bay water at volumes deemed to be unacceptable by the Executive Officer.

Hydraulic Containment

5. Chevron shall monitor the "A Zone" for contaminants on the downgradient side of the GPS trench/barrier and groundwater levels on both sides of the GPS trench/barrier for the primary purpose of evaluating the effectiveness of the GPS. Chevron shall demonstrate compliance with Specification B.4 by submitting, pursuant to the Self-Monitoring and Reporting Program attached to this Order, potentiometric water elevation contour maps which graphically demonstrate maintenance of an inward hydraulic gradient into the GPS.

6. Chevron shall operate the GPS as a corrective action measure for remediation of groundwater contamination along the San Pablo Bay side of the Refinery for at least one year after compliance has been achieved with the Maximum Allowable Concentration Limits established by this Order before any reduction or termination of groundwater extraction will be considered (see attached Self-Monitoring Program).

7. If it is determined by the Executive Officer, based on groundwater monitoring information, that water quality impairment downgradient of the GPS is not improving, or continues to degrade, Chevron may be required to submit additional site- specific groundwater corrective action proposals.

Alkane Plant Plume Remediation

8. Chevron shall continue extracting free-phase hydrocarbons and contaminated groundwater from the central portion of the Alkane Plant plume area such that contaminants do not migrate further from the source. The contaminant extraction shall be performed until cleanup levels are achieved. Chevron shall propose cleanup levels, extraction rates, and/or other performance evaluation criteria, acceptable to the Executive Officer, for the Alkane Plant plume remediation system per Provision C.4.

9. S.P. Hill Tankfield Groundwater Cleanup Requirements

   a. Chevron shall continue to operate the S.P. Hill Hydrocarbon Recovery System as initially required under Site Cleanup Requirements Order No. 93-016 until it receives written approval from the Executive Officer to cease operations. To be eligible for this approval, Chevron must submit a written request that includes adequate supporting documentation demonstrating that free-phase liquid hydrocarbon recovery is no longer technically feasible and cost-effective in this part of the refinery (see Provision C.10).

   b. Chevron shall continue to operate the S.P. Hill Groundwater Extraction System as initially required under Site Cleanup Requirements Order No. 93-016 until it receives written approval from the Executive Officer to cease operations. To be eligible for this approval Chevron must submit a written request certifying that the Maximum Allowable Concentration Limits (MACLs) for the Bayside Sector – South have not been exceeded in any groundwater monitoring wells sampled per the attached Self-Monitoring Program for at least four consecutive reporting periods (see Provision C.11).

Free-Phase Liquid Petroleum Hydrocarbon (FPLH) Recovery

10. Chevron shall perform recovery activities, as needed, to remove FPLH from beneath the refinery. The GPS, where present, is designed to function as a groundwater containment system that captures and prevents offsite migration of dissolved constituents; it is not intended to perform FPLH source control. FPLH recovery may be necessary to reduce the source for dissolved constituents that are introduced via the free-phase. Chevron shall propose the methods to achieve this specification and the degree of cleanup but the proposal must be acceptable to the Executive Officer (see Provision C.5).

Spill Reporting and Documentation of Cleanup

11. Chevron shall notify this Board of any reportable quantity (42 gallons or more) of petroleum as defined in Health & Safety Code Chapter 6.67 *Above Ground Storage of Petroleum* that is either spilled or leaked to any unlined ground surface (any surface not protected by a barrier which is impermeable to petroleum

products or other constituents which may cause adverse water quality impacts). Verbal notification shall be within one working day of knowledge of the spill and shall be followed by a written description to include the nature, location and volume of the spill, and the total area and/or soil volume affected. In addition, the written report shall include a map which identifies the location of the spill and photographic documentation of the spill area before and after cleanup (see Provision C.6).

12. Soil Contamination and Excavated Soil Reuse
Chevron shall notify this Board of any soil contamination, not previously identified in subsurface investigations, discovered during any subsurface investigation or excavation work conducted on refinery property, which may potentially adversely impact water quality. Chevron shall store, reuse, and/or dispose of non-hazardous contaminated soil according to a plan acceptable to the Executive Officer (see Provision C.7).

Aboveground Petroleum Storage Tanks

13. All aboveground petroleum storage tanks, subject to Chapter 6.67, Section 25270 of the Health and Safety Code, shall comply with all provisions of that section and Part 112 of the Code of Federal Regulations. All tanks shall be adequately monitored to assure that petroleum products will not discharge to surface and subsurface waters of the State. All tanks not fitted with leak detection bottoms, or with a tank leak detection monitoring system/method approved by the Executive Officer, shall have, in the interim, their tank bottoms tested for integrity and thickness according to API Standard 653 or the most current industry or regulatory-approved standard. For tanks without leak detection bottoms, the internal tank bottom inspection interval shall be no more than 10 years for tanks that have been inspected at least once under the approved schedule. Initial tank inspections shall depend on the corrosion rates measured during previous inspections or anticipated based on experience with tanks in similar service (see Provision C.11).

14. Chevron shall conduct monitoring activities according to the Self-Monitoring and Reporting Program attached to this Order and as may be amended by the Executive Officer to verify the effectiveness of groundwater containment and/or closure systems.

15. At any time, Chevron may file a written request (including supporting documentation) with the Executive Officer, proposing modifications to the attached Self-Monitoring and Reporting Program. If the proposed modifications are acceptable, the Executive Officer may issue a letter of approval that incorporates the proposed revisions into the Self-Monitoring and Reporting Program.

16. At any time, Chevron may file a written request (including supporting documentation) with the Executive Officer, proposing modifications to standard operating plans and procedures related to compliance with this Order as required

under Provisions C.5, C.7, C.9, (Free-Phase Liquid Petroleum Hydrocarbon Recovery Plan, Soils Management Plan, AGT Internal Tank Bottom Inspection Schedule) or as necessary for implementing the attached Self-Monitoring Program (Standard Operating Procedures for Groundwater Monitoring).

17. Components of the GPS Engineering Report pertaining to operation of the system may be amended as appropriate to incorporate changes in technology that will improve operational efficiency. All proposed changes shall be submitted in writing to the Executive Officer for review and approval.

18. Chevron shall comply with all applicable provisions of 27CCR and/or 23CCR Chapter 15 that are not specifically referred to in this Order.

C. PROVISIONS

1. Chevron shall implement any Self-Monitoring and Reporting Program (SMP) issued by the Executive Officer.

2. All technical and monitoring reports required to be submitted pursuant to this Order are being requested pursuant to Section 13267 of the California Water Code. Failure to submit reports in accordance with schedules established by this Order or failure to submit a report of sufficient technical quality to be acceptable to the Executive Officer may subject Chevron to enforcement action pursuant to Section 13268 of the California Water Code.

   a. Chevron shall comply with all Prohibitions, Specifications and Provisions of this Order, immediately upon adoption of this Order or as provided below. All report submittals must be acceptable to the Executive Officer.

   b. Technical reports/plans, submitted by Chevron, in compliance with the Prohibitions, Specifications, and Provisions of this Order shall be submitted to the Board on the schedule specified herein. These reports/plans shall consist of a letter report that includes the following:

      i. Identification of any obstacles which may threaten compliance with the schedule;
      ii. In the event of non-compliance with any Prohibition, Specification or Provision of this Order, written notification which clarifies the reasons for non-compliance and which proposes specific measures and a schedule to achieve compliance. This written notification shall identify work not completed that was projected for completion, and shall identify the impact of non-compliance on achieving compliance with the remaining requirements of this Order; and,

iii. In the self-monitoring reports (See attached SMP), an evaluation of the current groundwater monitoring system and a proposal for modifications as appropriate.

3. **POLLARD POND RISK ANALYSIS AND MANAGEMENT PLAN**

Chevron shall submit a plan, acceptable to the Executive Officer, describing its land use and management plans for Pollard Pond during postclosure and evaluating any potential risks to human or ecological receptors that may result from remaining non-hazardous petroleum hydrocarbon contaminated soils in the excavated portion of the pond. The plan shall also document pH level changes and reductions in petroleum hydrocarbon concentrations, if any, in soil in the excavated portion of Pollard Pond since 1994.

COMPLIANCE DATE: June 30, 2001

4. **ALKANE PLANT PLUME REMEDIATION GOALS PLAN**

Chevron shall submit a plan, acceptable to the Executive Officer, presenting cleanup goals and criteria for evaluating the success of the Alkane Plant Groundwater Remediation System (APGRS), including criteria for evaluating the feasibility and cost-effectiveness of operating the APGRS as a free-phase hydrocarbon and contaminated groundwater recovery system. The plan shall also present a rationale for determining when continued recovery operations are no longer necessary.

COMPLIANCE DATE: June 30, 2001

5. **FREE-PHASE LIQUID PETROLEUM HYDROCARBON RECOVERY EVALUATION PLAN**

Chevron shall submit a plan, acceptable to the Executive Officer, which provides a rationale and methodology for determining whether and to what extent free-phase liquid petroleum hydrocarbons, discovered during routine groundwater well monitoring, are recoverable. The plan shall propose a method for estimating short- and long-term hydrocarbon recovery rates that can be reasonably achieved by various recovery system alternatives, and compare these rates to the estimated subsurface migration rate of the hydrocarbons.

COMPLIANCE DATE: December 31, 2000

6. **SPILL REPORTING AND DOCUMENTATION OF CLEANUP**

Chevron shall notify this Board of any reportable quantity (42 gallons or more) of petroleum as defined in Health & Safety Code Chapter 6.67 Above Ground

Storage of Petroleum that is either spilled or leaked to any unlined ground surface (any surface not protected by a barrier which is impermeable to petroleum products or other constituents which may cause adverse water quality impacts). Verbal or electronic (e-mail) notification of the spill shall be within one working day of knowledge of the spill and shall be followed by a written report to include the nature, location and volume of the spill, and the total area and/or soil volume affected. In addition, the written report shall include a map which identifies the location of the spill, photographic documentation of the spill area both before and after cleanup, and a description of the cleanup actions performed. The initial photograph shall be taken as soon as is practical considering both health and safety concerns. If the cleanup is not completed within 14 days of discovery of the spill, a summary of cleanup actions performed and an "after" photograph shall be submitted immediately upon completion.

COMPLIANCE DATE: Within 14 calendar days of discovery of spill

7. **CONTAMINATED SOIL MANAGEMENT PLAN**

Chevron shall submit a plan, acceptable to the Executive Officer, for managing non-hazardous contaminated soil discovered on refinery property during subsurface investigation or excavation work. The plan shall include, but not be limited to, descriptions of soil sampling, storage, and handling protocols and criteria for reusing non-hazardous contaminated soil within the refinery.

COMPLIANCE DATE: December 31, 2000

8. **CORRECTIVE ACTION WORK PLAN FOR #1 OXIDATION POND PASSES 2 THROUGH 5**

Chevron shall submit a work plan and schedule, acceptable to the Executive Officer, which proposes corrective action measures for petroleum hydrocarbon contaminated soil in passes 2 through 5 of #1 Oxidation Pond. The plan shall address evaluation and management of risks to potential human and ecological receptors at this site and shall include corrective action alternatives designed to minimize any identified risks.

COMPLIANCE DATE: March 31, 2001

9. **CORRECTIVE ACTION WORK PLAN FOR 250 FOOT CHANNEL**

Chevron shall submit a work plan and schedule, acceptable to the Executive Officer, which proposes corrective action measures for petroleum hydrocarbon contaminated sediment in the 250 Foot Channel site. The plan shall address evaluation and management of risks to potential human and ecological receptors

at this site and shall include corrective action alternatives designed to minimize any identified risks.

COMPLIANCE DATE: March 31, 2001

10. **ABOVEGROUND PETROLEUM STORAGE TANK SECONDARY CONTAINMENT AND SPILL PREVENTION**

Chevron shall submit a technical report, which includes a detailed map identifying all tanks regulated under Chapter 6.67, Section 25270 of the Health and Safety Code, and Part 112 of the Code of Federal Regulations. Secondary containment features for all regulated storage tanks shall be identified on the map. Arrows identifying the direction of petroleum flow from a regulated tank to the containment area shall be drawn on the map unless the secondary containment consists of dikes, berms, or walls that immediately surround the tank. Chevron shall document in the report spill prevention plans to reduce the likelihood of a release of petroleum from a tank to permeable surfaces.

COMPLIANCE DATE: June 30, 2001

11. **ABOVEGROUND PETROLEUM STORAGE TANK INTERNAL TANK BOTTOM INSPECTION SCHEDULE**

Chevron shall submit a report, acceptable to the Executive Officer, every two years as indicated in the compliance date below, which updates the internal tank bottom inspection schedule for all aboveground petroleum storage tanks that do not have leak detection bottoms and are subject to Chapter 6.67, Section 25270 of the Health and Safety Code.

COMPLIANCE DATE: July 1, each even-numbered year

12. **REQUEST TO CEASE OPERATION OF THE S.P. HILL FREE-PHASE HYDROCARBON RECOVERY SYSTEM**

Chevron shall submit a report, acceptable to the Executive Officer, which demonstrates that free-phase liquid hydrocarbon recovery is no longer technically feasible or cost-effective and that termination of the program will not allow further subsurface migration of either free-phase or dissolved constituent plumes or any other adverse impacts to groundwater or surface water quality.

COMPLIANCE DATE: 60 days prior to shutting down system

13. **REQUEST TO CEASE OPERATION OF THE S.P. HILL GROUNDWATER EXTRACTION SYSTEM**

Chevron shall submit a report, acceptable to the Executive Officer, certifying that the Maximum Allowable Concentration Limits (MACLs) for the Bayside Sector – South have not been exceeded in any groundwater monitoring wells sampled per the attached Self-Monitoring Program for at least four consecutive reporting periods.

COMPLIANCE DATE: 60 days prior to shutting down system

14. **FINANCIAL ASSURANCE INSTRUMENT**

Chevron shall obtain and maintain a **Financial Assurance Instrument** acceptable to the Executive Officer until the end of the Post-Closure Maintenance Period for any classified waste management unit subject to the California Code of Regulations Title 27, Chapter 6, Subdivision 1, Division 2. Chevron shall submit a report every five years that either validates the Instrument's ongoing viability or proposes and substantiates any needed changes (e.g., a documented increase in the monitoring systems' ability to provide reliable early detection of a release can cause a decrease in the Instrument's financial coverage). For the purposes of planning the amount of the fund, Chevron shall assume a post-closure period of at least 30 years. However, the post-closure maintenance period shall extend as long as the wastes pose a threat to water quality.

COMPLIANCE DATE: July 31, 2000 and every five years thereafter.

15. **POST EARTHQUAKE INSPECTION REPORT**

Chevron shall submit a detailed **Post Earthquake Inspection Report** acceptable to the Executive Officer, in the event of any earthquake generating ground shaking of Richter Magnitude 7.0 or greater at or within 30 miles of the Facility. The report shall describe the waste management unit containment features, groundwater monitoring, and control facilities potentially impacted by the static and seismic deformations. Damage to any waste containment facility which may impact State waters must be reported to the Regional Board staff case manager for the Chevron Refinery within one working day of knowledge of the damage.

COMPLIANCE DATE: Within 12 weeks of Earthquake

16. **Duty to Comply**: Chevron must comply with all conditions of these waste discharge requirements. Violations may result in enforcement actions, including Regional Board orders or court orders requiring corrective action or imposing civil monetary liability, or in modification or revocation of these waste discharge

requirements by the Regional Board. (CWC Section 13261, 13263, 13265, 13268, 13300, 13301, 13304, 13340, 13350).

17. **General Prohibition**: Neither the treatment nor the discharge of waste shall create a pollution, contamination or nuisance, as defined by Section 13050 of the California Water Code (CWC). (H & SC Section 5411, CWC Section 13263)

18. **Availability**: A copy of these waste discharge requirements shall be maintained at the discharge facility and be available at all times to operating personnel. (CWC Section 132631)

19. **Change In Ownership**: Chevron must notify the Executive Officer, in writing at least 30 days in advance of any proposed transfer of this Order's responsibility and coverage to a new discharger. The notice must include a written agreement between the existing and new discharger containing a specific date for the transfer of this order's responsibility and coverage between the current discharger and the new discharger. This agreement shall include an acknowledgment that the existing discharger is liable for violations up to the transfer date and that the new discharger is liable from the transfer date on. [CWC Sections 13267 and 13263]

20. **Change in Discharge**: In the event of a material change in the character, location, or volume of a discharge, Chevron shall file with this Regional Board a new Report of Waste Discharge. [CWC Section 13260(c)]. A material change includes, but is not limited to, the following:

    (a) Addition of a major industrial waste discharge to discharge of essentially domestic sewage, or the addition of a new process or product by an industrial facility resulting in a change in the character of the waste.

    (b) Significant change in disposal method, e.g., change from a land disposal to a direct discharge to water, or change in the method of treatment which would significantly alter the characteristics of the waste.

    (c) Significant change in the disposal area, e.g., moving the discharge to another drainage area, to a different water body, or to a disposal area significantly removed from the original area potentially causing different water quality or nuisance problems.

    (d) Increase in flow beyond that specified in the waste discharge requirements.

    (e) Increase in area or depth to be used for solid waste disposal beyond that specified in the waste discharge requirements. [CCR Title 23 Section 2210]

21. **Revision**: These waste discharge requirements are subject to review and revision by the Regional Board. [CCR Section 132631]

22. **Termination**: Where Chevron becomes aware that it failed to submit any relevant facts in a Report of Waste Discharge or submitted incorrect information in a Report of Waste Discharge or in any report to the Regional Board, it shall promptly submit such facts or information. [CWC Sections 13260 and 13267]

23. **Vested Rights**: This Order does not convey any property rights of any sort or any exclusive privileges. The requirements prescribed herein do not authorize the commission of any act causing injury to persons or property, do not protect Chevron from his liability under Federal, State or local laws, nor do they create a vested right for Chevron to continue the waste discharge. [CWC Section 13263(g)]

24. **Severability**: Provisions of these waste discharge requirements are severable. If any provisions of these requirements are found invalid, the remainder of these requirements shall not be affected. [CWC 9213]

25. **Operation and Maintenance**: Chevron shall, at all times, except during maintenance, effluent system management during major storm events, or emergency shutdowns, properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by Chevron to achieve compliance with conditions of this Order. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls including appropriate quality assurance procedures. [CWC Section 13263(f)]

26. **Reporting of Hazardous Substance Release**: If any hazardous substance is discharged in or on any waters of the State, or discharged or deposited where it is, or probably will be, discharged in or on any waters of the State, Chevron shall report such discharge to the Regional Board by calling (510) 622-2300 during regular office hours (Monday through Friday, 8:00 to 5:00).

    A written report shall be filed with the Board within five working days. The report shall describe: the nature of the hazardous substance, estimated quantity involved, duration of incident, cause of release, estimated size of affected area, nature of effect, corrective actions taken or planned, schedule of corrective actions planned, and persons/agencies notified.

27. **Entry and Inspection**: Chevron shall allow the Regional Board, or an authorized representative upon the presentation of credentials and other documents as may be required by law, to:

(a) Enter upon the discharger's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this order;

(b) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this order;

(c) Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Order; and

(d) Sample or monitor at reasonable times, for the purposes of assuring compliance with this order or as otherwise authorized by the California Water Code, any substances or parameters at any location. [CWC Section 13267]

28. **Analytical Methods**: Unless otherwise permitted by the Regional Board Executive officer, all analyses shall be conducted at a laboratory certified for such analyses by the State Department of Health Services. All analyses shall be required to be conducted in accordance with the latest edition of "Guidelines Establishing Test Procedures for Analysis of Pollutants" [40 CFR Part 136] promulgated by the U.S. Environmental Protection Agency. [CCR Title 23, Section 2230]

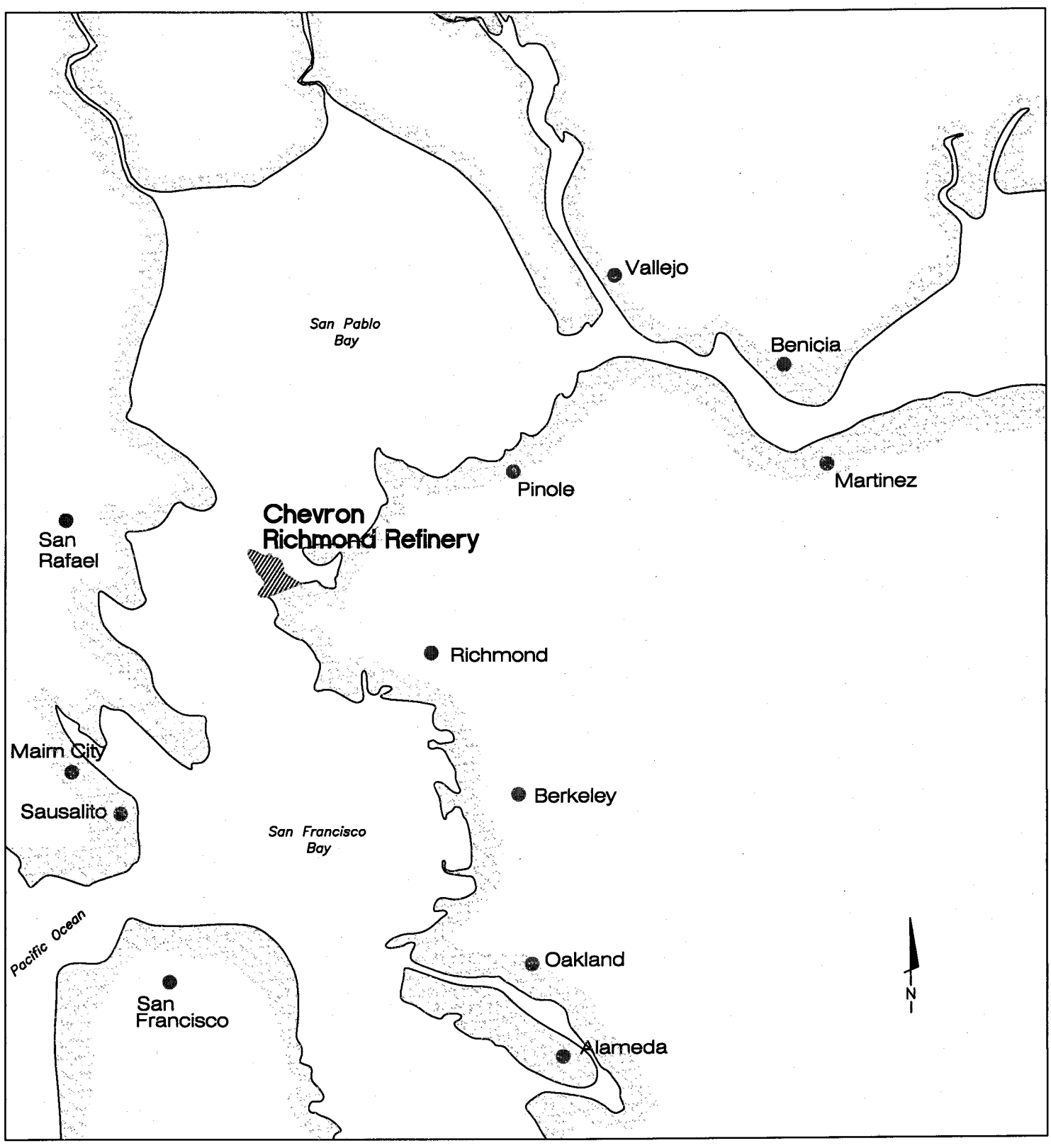
29. This Order supersedes Cease and Desist Order 91-098, Waste Discharge Requirements Orders 92-010 and 93-109, and Site Cleanup Requirements Orders 90-146, 92-092, and 93-016. Orders 90-146, 91-098, 92-010, 92-092, 93-016 and 93-109 are hereby rescinded.

I, Lawrence P. Kolb, Acting Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on June 21, 2000.

for Lawrence P. Kolb
Acting Executive Officer

Attachments: Figure 1 - Site Location Map
Figure 2 – Refinery Geomorphic Boundaries
Figure 3 – Groundwater Protection System Basic Design
Figure 4 – Refinery Sector Boundaries
Figure 5 – Plant 1 / Additives Plant Cap
Figure 6 – Pollard Sector
Figure 7 – Alkane Sector
Figure 8 – Landfarm / Landfill Sector
Figure 9 - Bayside Sector
Figure 10 - Effluent Sector
Figure 11 – Reclamation Sector

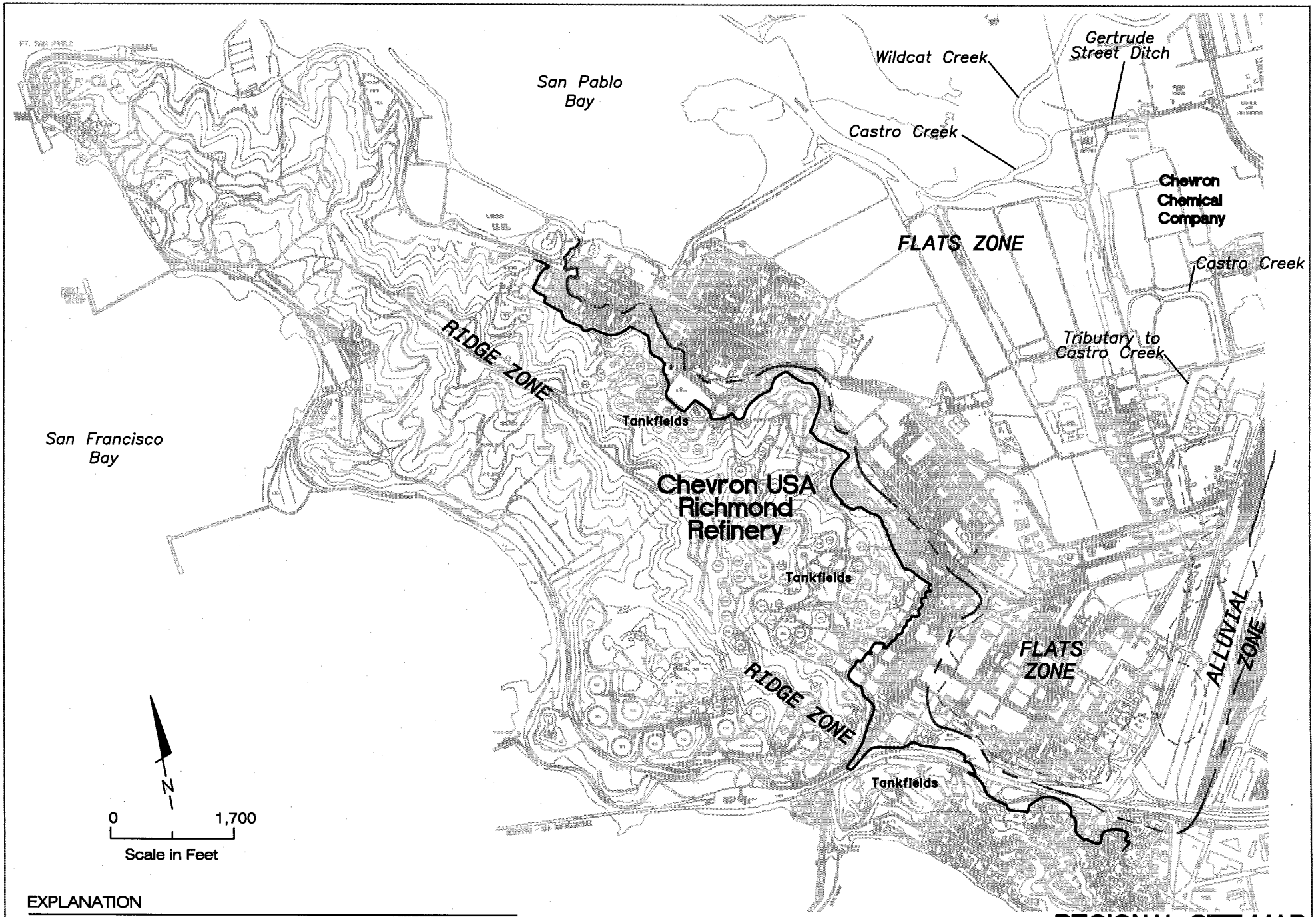
Self-Monitoring and Reporting Program



LOCATION MAP

Chevron Richmond Refinery
Waste Discharge Requirements

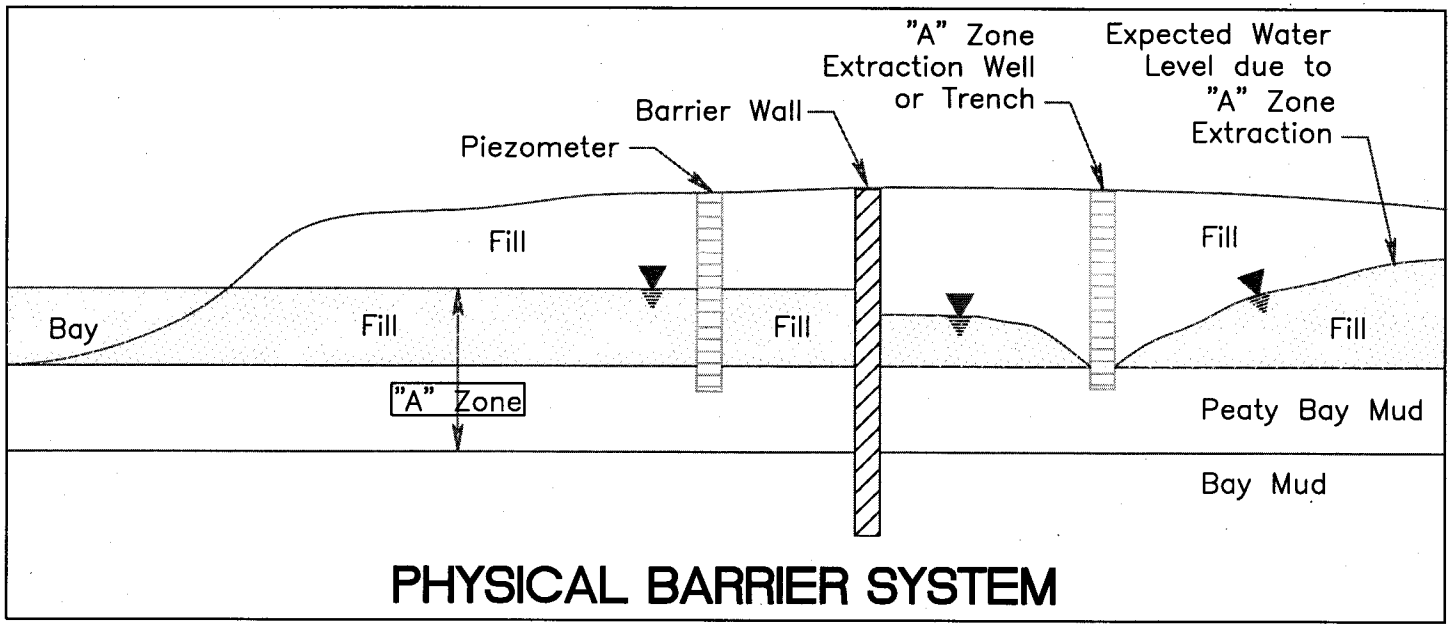
Figure 1

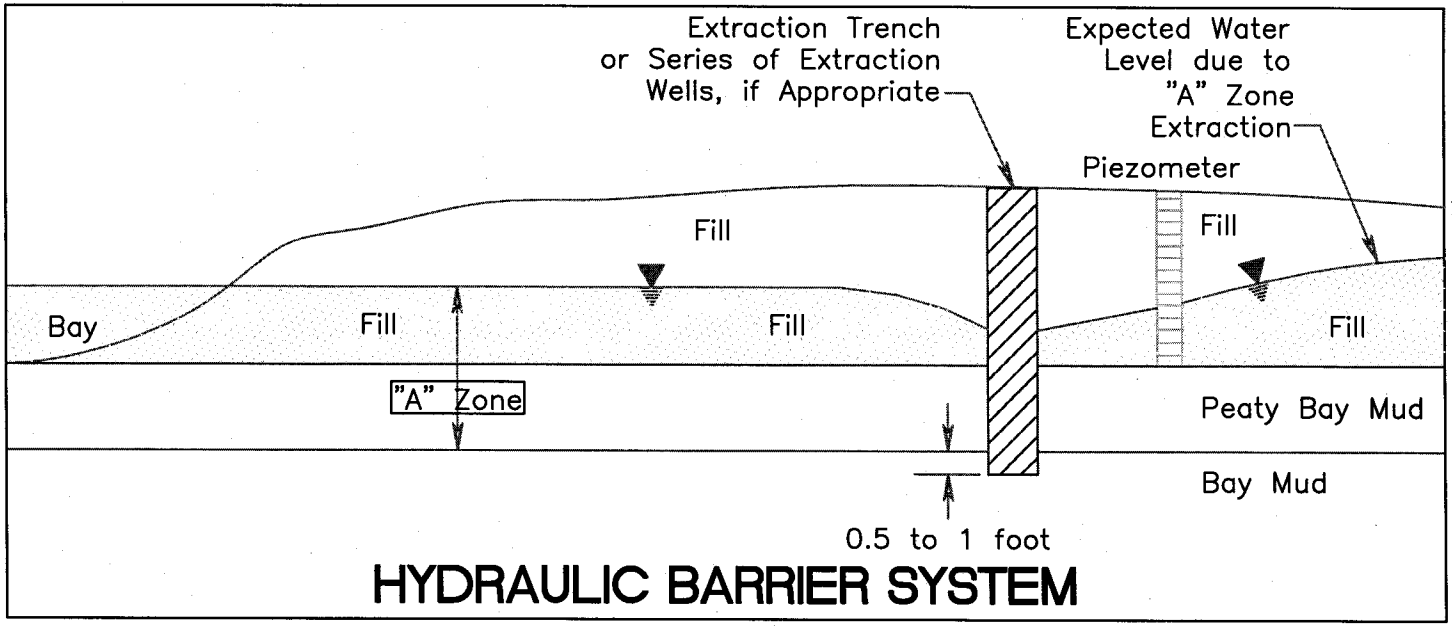


REGIONAL SITE MAP WITH GEOMORPHIC BOUNDARIES

Chevron Richmond Refinery
Waste Discharge Requirements

Figure 2

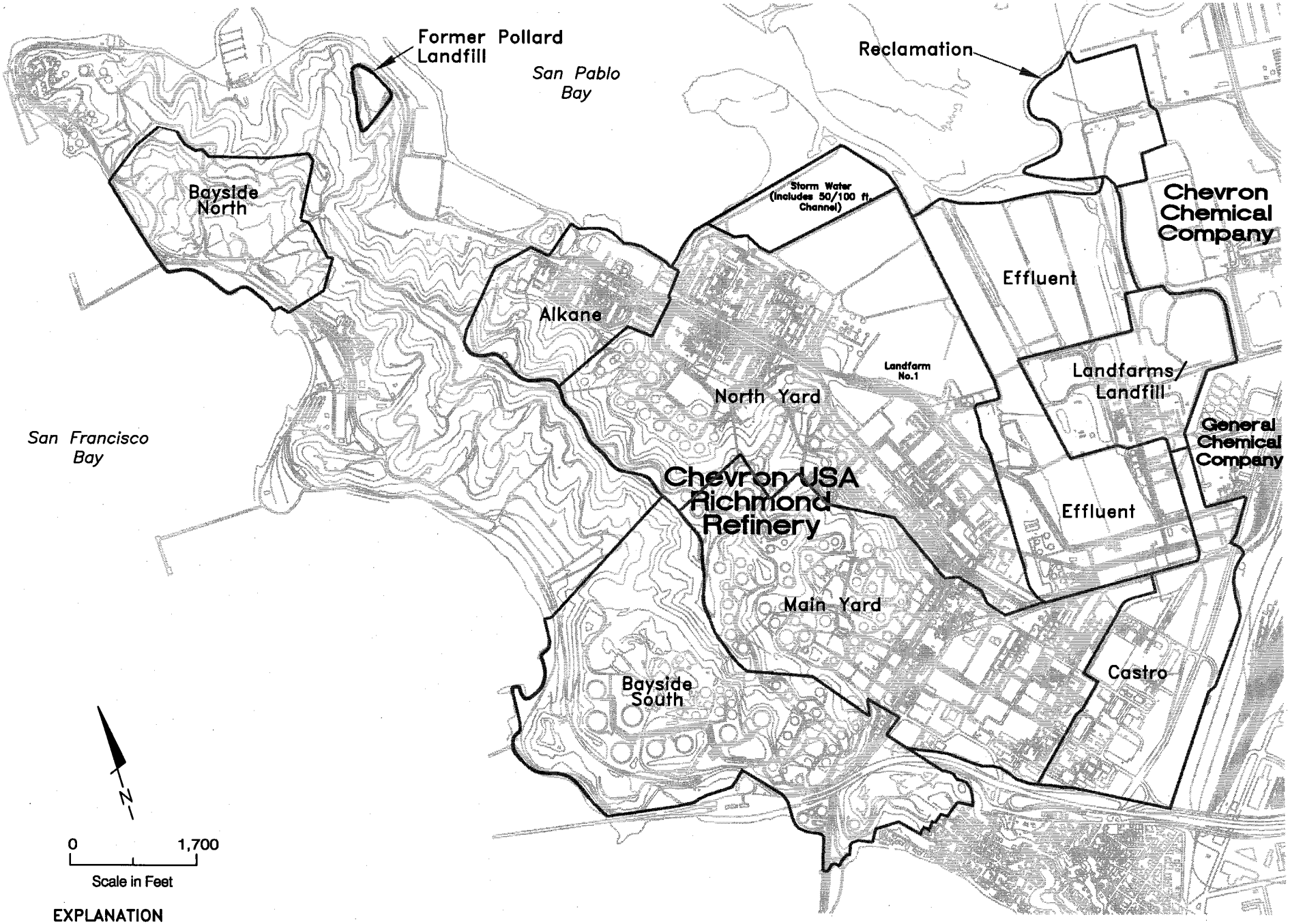




GROUNDWATER PROTECTION SYSTEM

Chevron Richmond Refinery
Waste Discharge Requirements

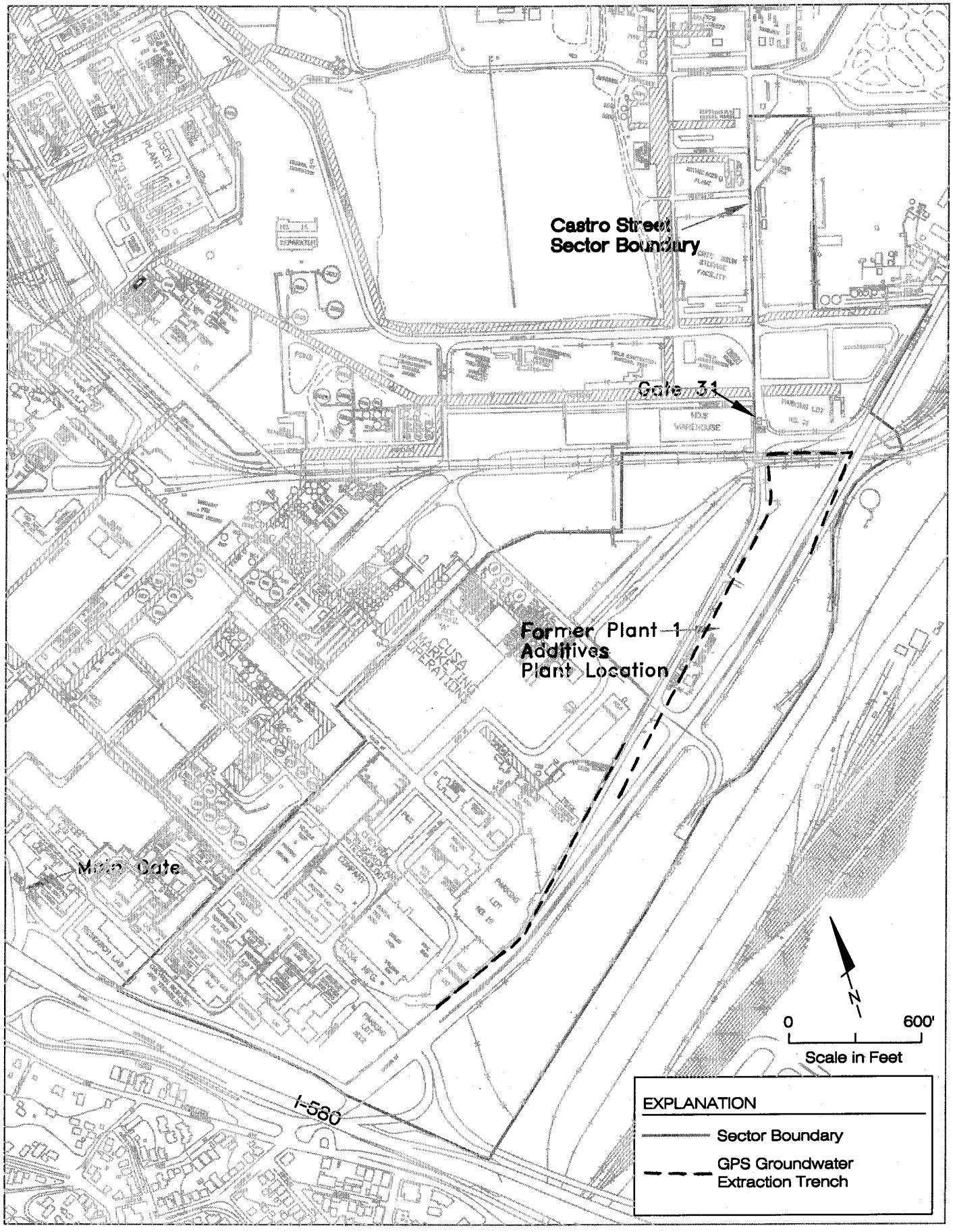
Figure 3



SECTOR BOUNDARIES

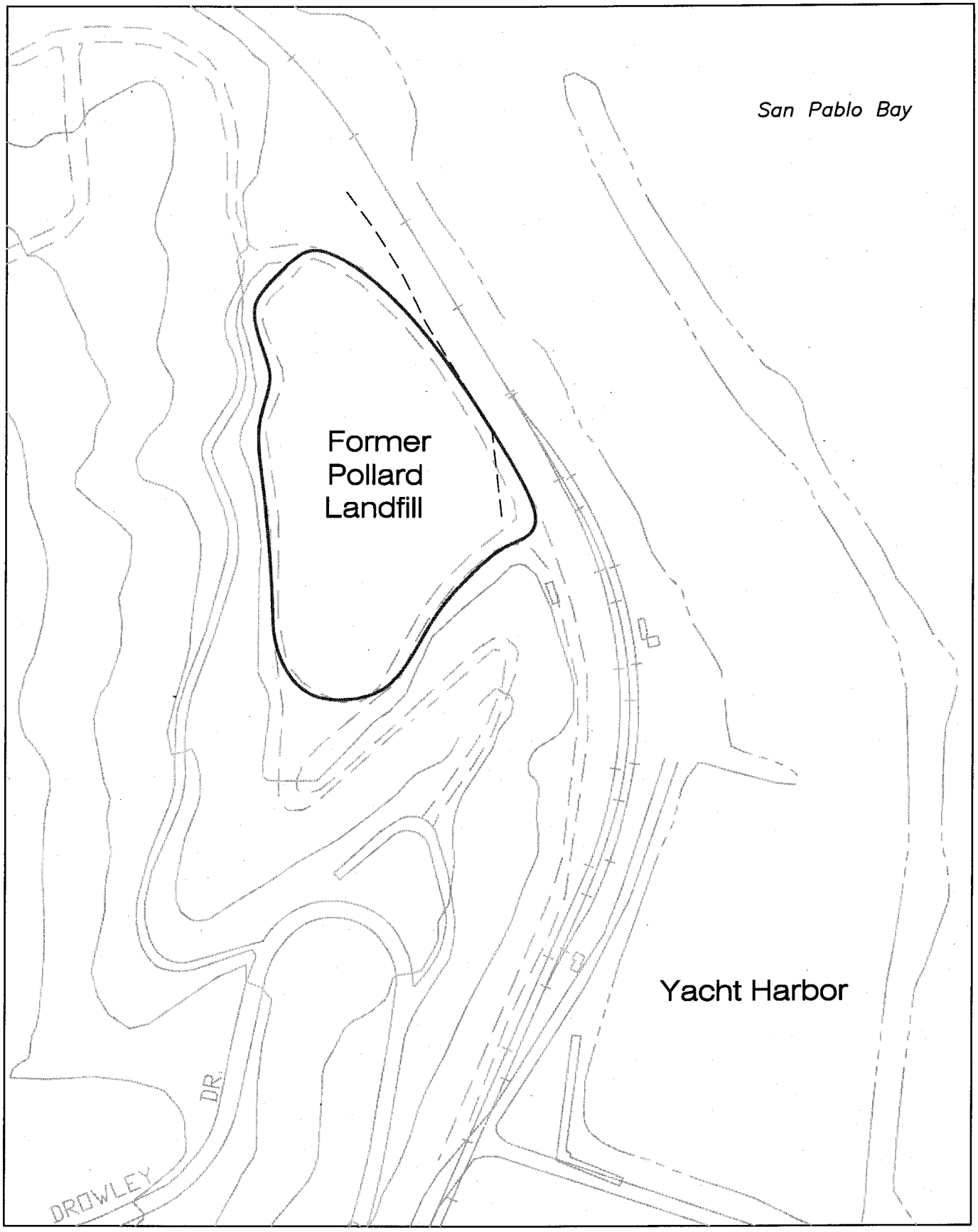
Chevron Richmond Refinery
Waste Discharge Requirements

Figure 4



PLANT 1 / ADDITIVES PLANT CAP
Chevron Richmond Refinery
Waste Discharge Requirements

Figure 5



EXPLANATION

WDR Site Boundary

Groundwater Protection System (GPS) Extraction Trench

N

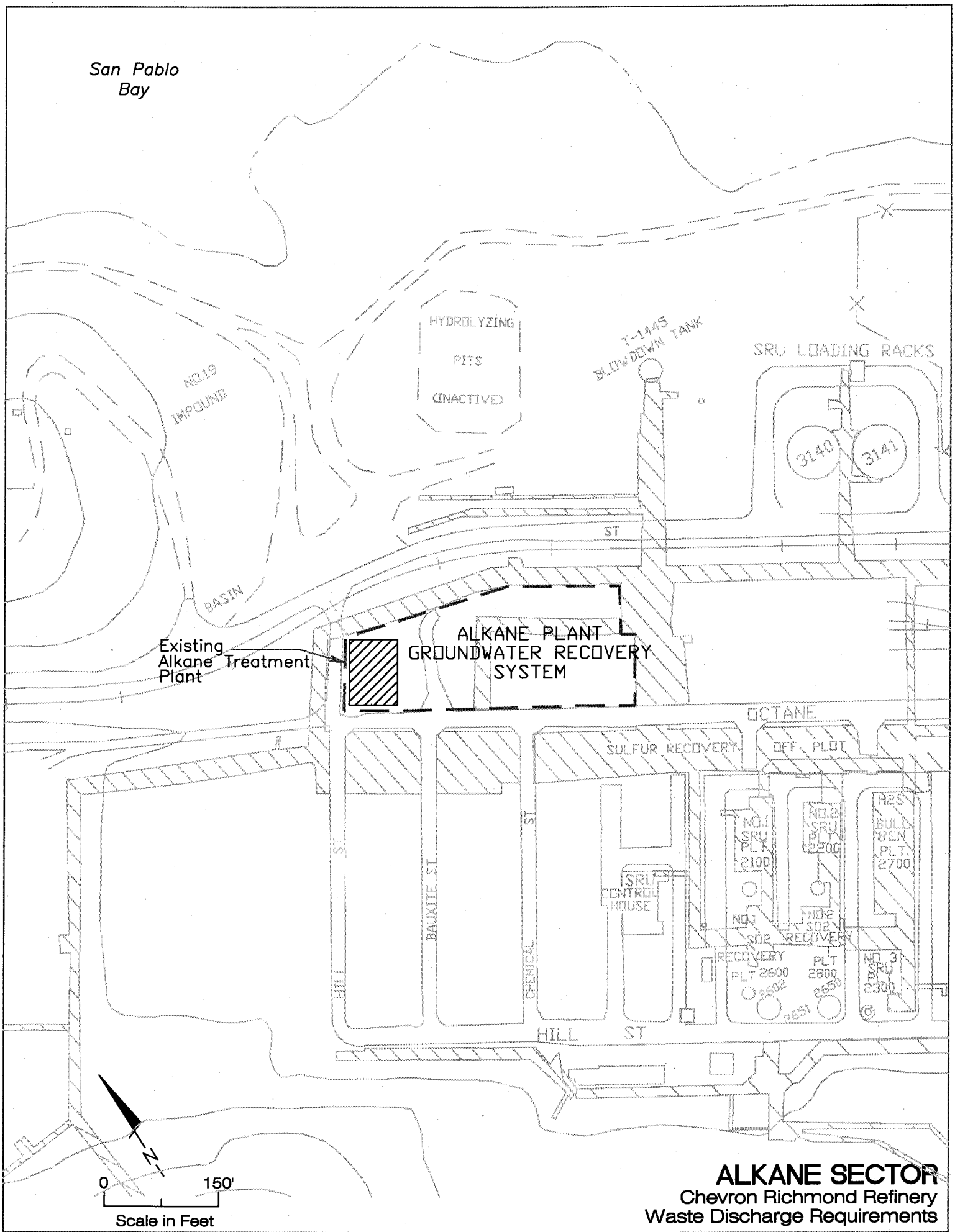
0 200'

Scale in Feet

POLLARD SECTOR

Chevron Richmond Refinery
Waste Discharge Requirements

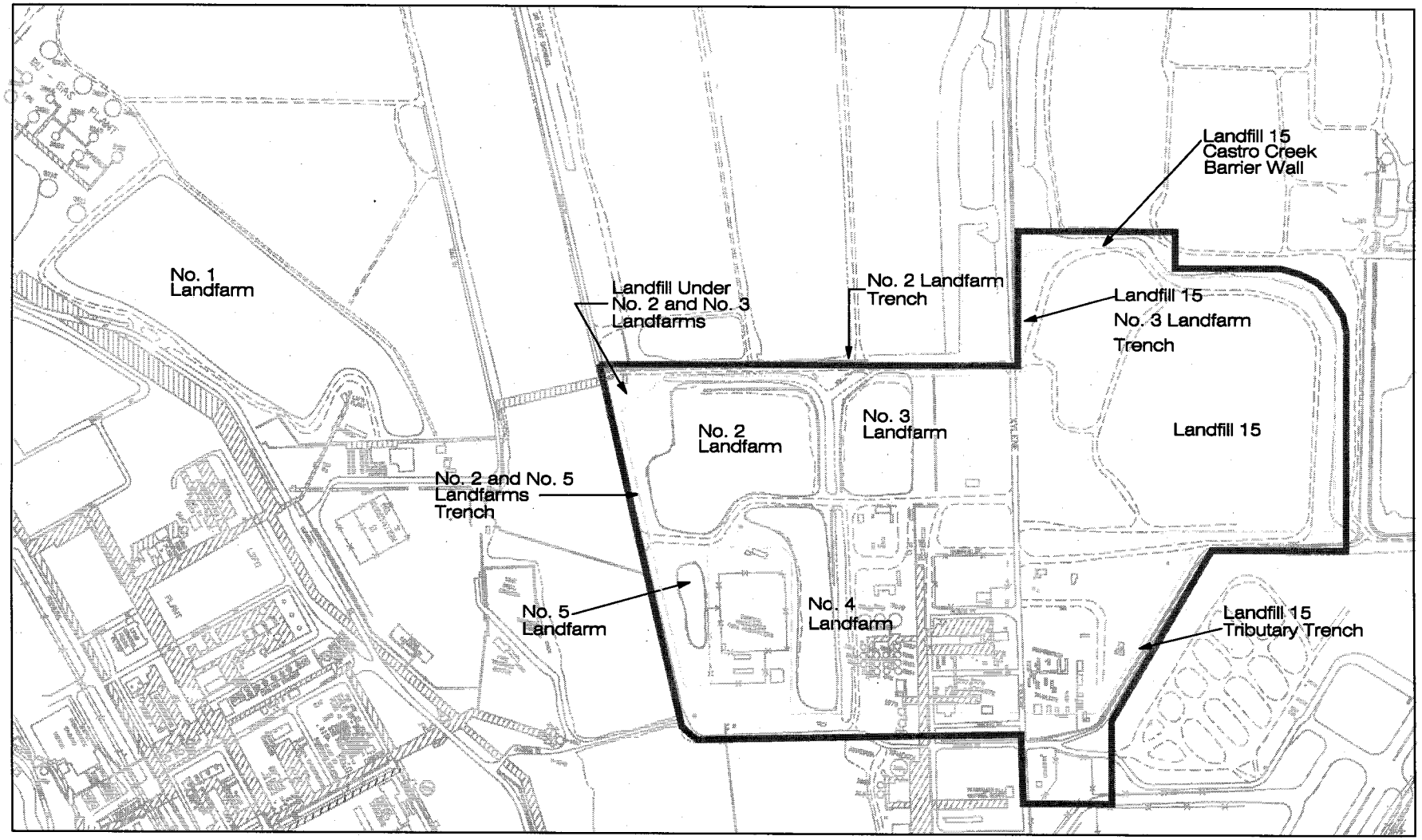
Figure 6



ALKANE SECTOR

Chevron Richmond Refinery
Waste Discharge Requirements

Figure 7



EXPLANATION

- Sector Boundary
- WDR Site Boundary
- Existing GPS Groundwater Extraction Trench

N

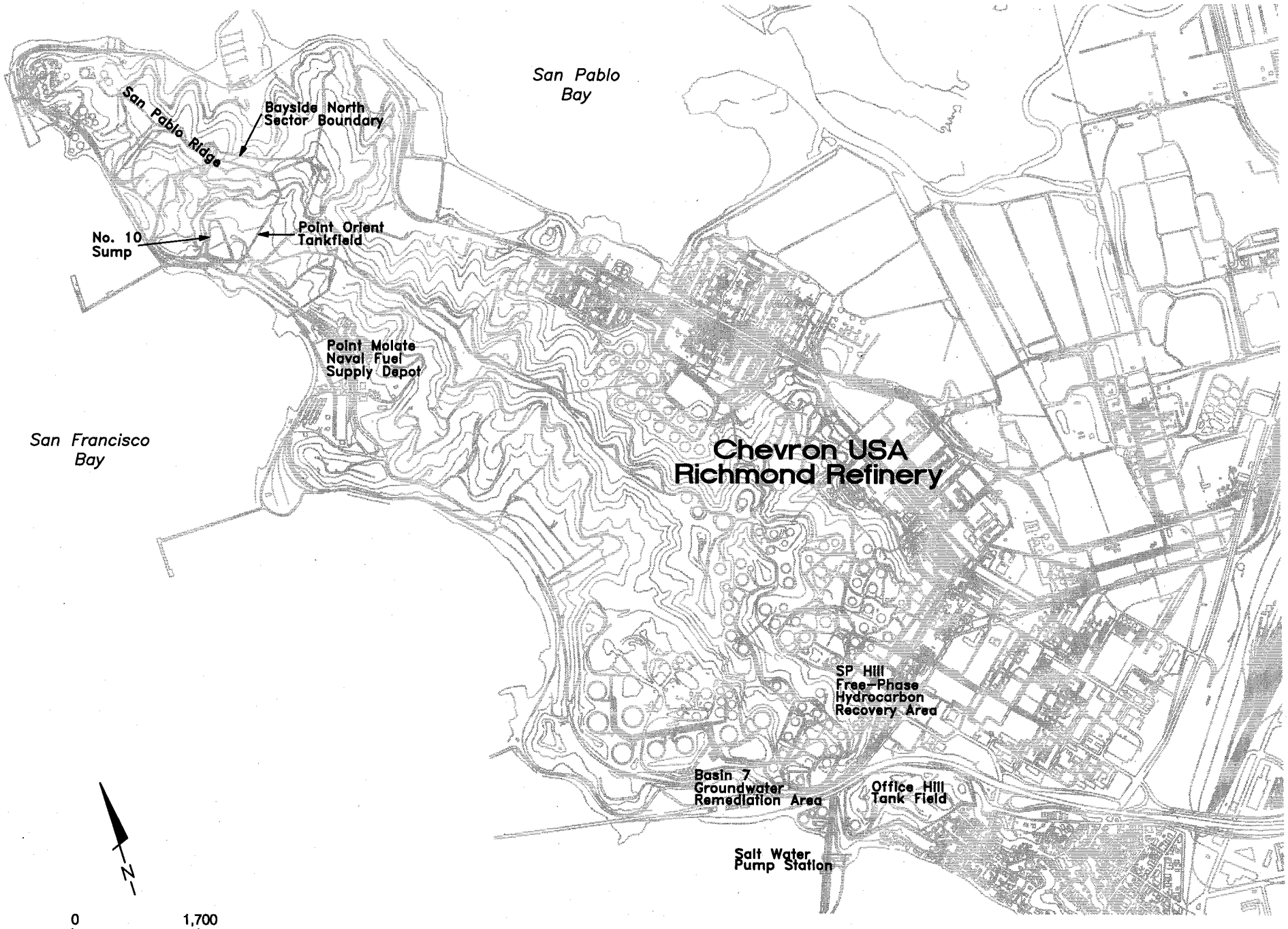
0 600

Scale in Feet

LANDFARM/LANDFILL SECTOR

Chevron Richmond Refinery
Waste Discharge Requirements

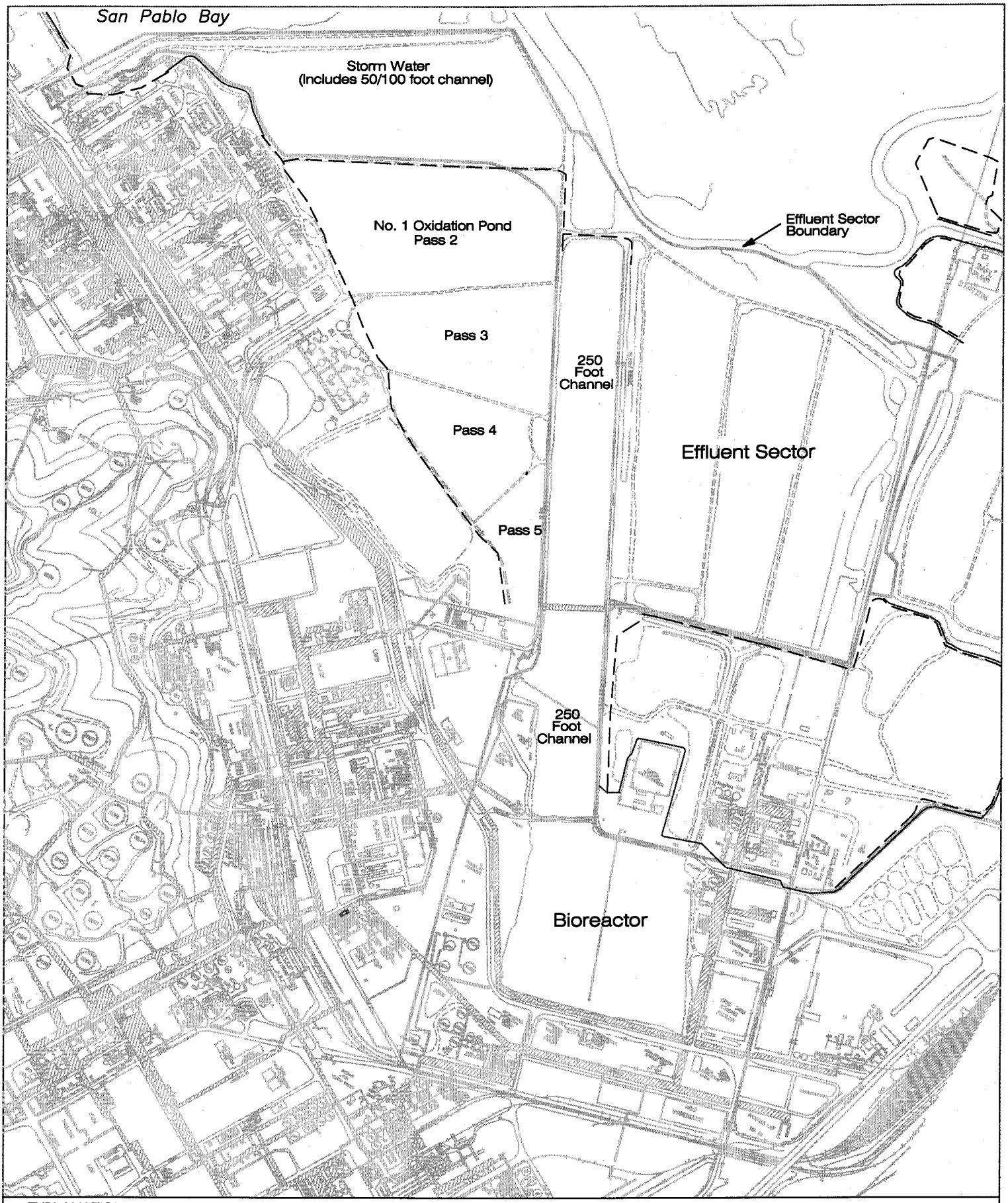
Figure 8



BAYSIDE SECTOR

Chevron Richmond Refinery
Waste Discharge Requirements

Figure 9



EXPLANATION

- Sector Boundary
- Groundwater Protection System (GPS)
- Barrier Wall
- Extraction Trench

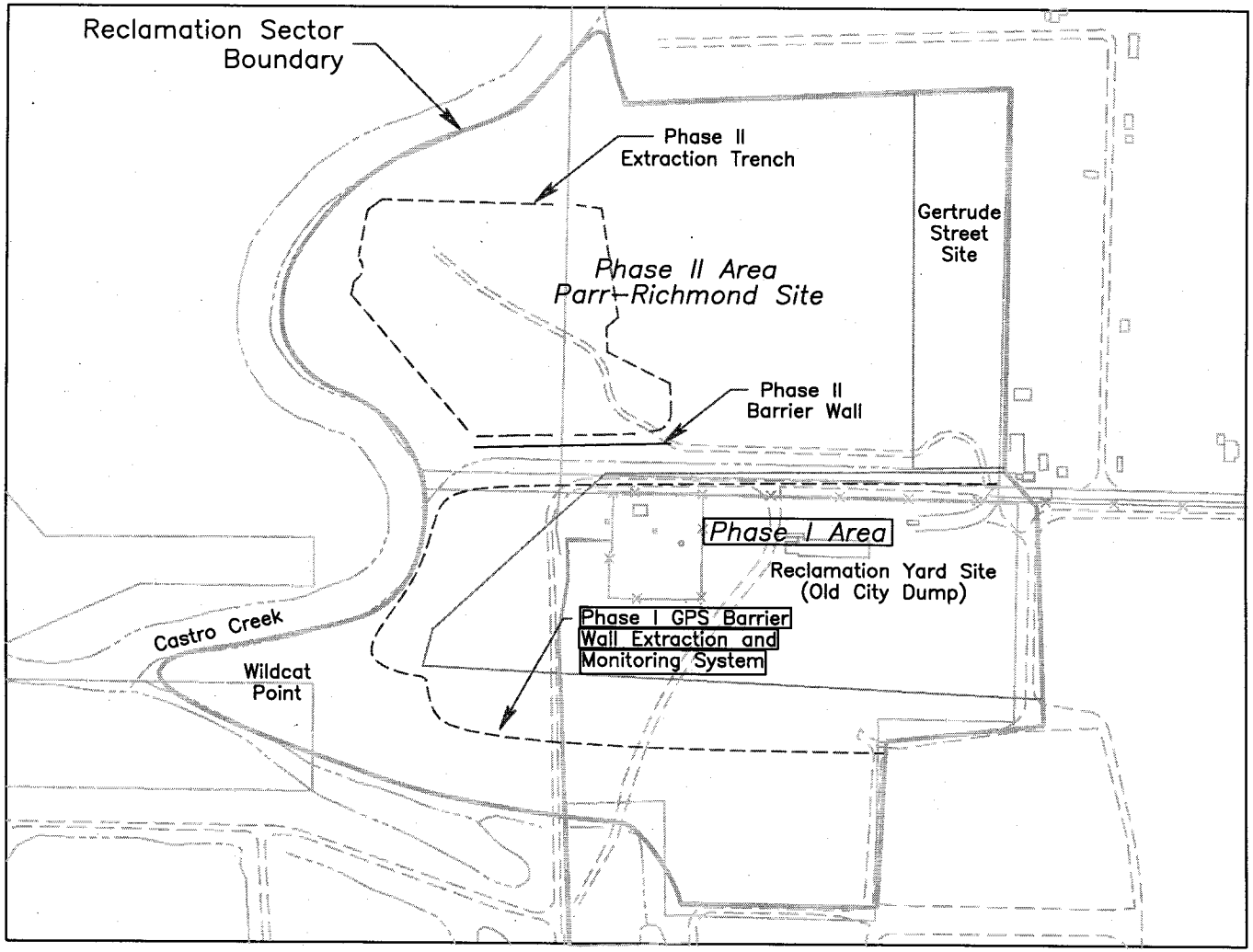
0 N 800

Scale in Feet

EFFLUENT SECTOR

Chevron Richmond Refinery
Waste Discharge Requirements

Figure 10



EXPLANATION

- Sector Boundary
- WDR Site Boundary
- Existing GPS Groundwater Extraction Wells and Slurry Wall

N

RECLAMATION SECTOR

Chevron Richmond Refinery
Waste Discharge Requirements

Figure 11

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

GROUNDWATER CORRECTIVE ACTION
SELF-MONITORING AND REPORTING PROGRAM

FOR

CHEVRON PRODUCTS COMPANY
RICHMON REFINERY

CONTRA COSTA COUNTY

ORDER NO. 00-043

A. GENERAL

1. Reporting responsibilities of waste dischargers are specified in Sections 13225(a), 13267(b), 13383, and 13387(b) of the California Water Code and this Regional Board's Resolution No. 73-16. This Self-Monitoring Program is issued in accordance with Provision C.1 of Regional Board Order No. 00-043.

2. The principal purposes of a discharge monitoring program are: (1) to document compliance with waste discharge requirements and prohibitions established by the Board, (2) to facilitate self-policing by the waste discharger in the prevention and abatement of pollution arising from waste discharge, (3) to develop or assist in the development of standards of performance, pretreatment and toxicity standards, and 4) to assist the discharger in complying with the requirements of the California Code of Regulations.

B. SAMPLING AND ANALYTICAL METHODS

1. Sample collection, storage, and analyses shall be performed according to the most recent version of EPA Standard Methods and in accordance with an approved sampling and analysis plan.

2. Water and waste analysis shall be performed by a laboratory approved for these analyses by the State of California. The director of the laboratory whose name appears on the certification shall supervise all analytical work in his/her laboratory and shall sign all reports of such work submitted to the Regional Board.

3. All monitoring instruments and equipment shall be properly calibrated and maintained to ensure accuracy of measurements.

C. DEFINITION OF TERMS

1. A grab sample is a discrete sample collected at any time.

2. Receiving waters refers to any water which actually or potentially receives surface or groundwater which passes over, through, or under waste materials or contaminated soils. The receiving waters in this case are the groundwater beneath and adjacent to the waste management units and other areas of concern, the surface runoff from the site, wetlands adjacent to the refinery, San Francisco Bay, and San Pablo Bay.

3. Standard observations refer to:

   a. Receiving Waters

i. Floating and suspended materials of waste origin: presence or absence, source, and size of affected area
ii. Discoloration and turbidity: description of color, source, and size of affected area
iii. Evidence of odors, presence or absence, characterization, source, and distance of travel from source

b. Perimeters of waste management units

i. Evidence of liquid leaving or entering the waste management units, estimated size of affected area and flow rate. (Show affected area on map)
ii. Evidence of odors, presence or absence, characterization, source, and distance of travel from source
iii. Evidence of erosion and/or daylighted waste

c. The waste management units

i. Evidence of ponded water at any point
ii. Evidence of odors, presence or absence, characterization, source, and distance of travel from source
iii. Evidence of erosion and/or daylighted waste

D. SAMPLING, ANALYSIS, AND OBSERVATIONS

The discharger is required to perform sampling, analyses, and observations in the following media:

1. Groundwater per Title 27, Section 20415(b)
2. Surface water per Title 27, Section 20415(c)
3. Per the general requirements specified in Title 27, Section 20415(e)

E. RECORDS TO BE MAINTAINED

Written reports shall be maintained by Chevron or its laboratory, and shall be retained for a minimum of five years. This period of retention shall be extended during the course of any unresolved litigation regarding this discharge or when requested by the Board. Such records shall show the following for each sample:

1. Identity of sample and sample station number.

2. Date and time of sampling.

3. Date and time that analyses are started and completed, and name of the personnel performing the analyses.

4. Complete procedure used, including method of preserving the sample, and the identity and volumes of reagents used.

5. Calculation of results.

6. Results of analyses, and detection limits for each analysis.

F. REPORTS TO BE FILED WITH THE BOARD

1. Chevron shall submit two Semi-annual Self-Monitoring and Reporting Program Reports (SMRs) per the due dates in the following table. For any given refinery sector as defined in Waste Discharge Requirements Order No. 00-043, samples shall be collected within a period of time not to exceed 30 days.

Report	Period Covered	Period That Samples Are to be Collected	Report Due Date
Winter/Spring	January 1 to June30	Feb 1 to April 30	August 31st
Summer/Fall	July 1 to December 31	August 1 to October 31	March 1st
Annual	January 1 To December 31	-	March 1st

Note: The annual report can be combined with the summer/fall semi-annual report.

The semi-annual reports shall include, but are not limited to the following:

a. Letter of Transmittal

A letter transmitting the essential points in each report should accompany each report. Such a letter shall include a discussion of significant findings from the last report period, and actions taken or planned for correcting the violations. If Chevron has previously submitted a detailed time schedule for correcting requirement violations, a reference to the correspondence transmitting such schedule will be satisfactory. If no violations have occurred in the last report period this shall be stated in the letter of transmittal. SMRs and the letter transmitting the SMRs shall be signed by a principal executive officer at the level of vice president or his duly authorized representative, if such representative is responsible for the overall operation of the facility from which the discharge originates. The

letter shall contain a statement by the official, under penalty of perjury, that to the best of the signer's knowledge the report is true, complete, and correct.

b. Each semi-annual SMR shall include a compliance evaluation summary. The summary shall contain but not be limited to:

i. A graphic description of the elevation, velocity, and direction of groundwater flow under/around the facility, based upon the past and present water level elevations and pertinent visual observations (data to be collected semi-annually for GPS hydraulic gradient monitoring and for refinery-wide A- and C-Zone groundwater gradient monitoring).

ii. The method and time of water level measurement, the type of pump used for purging, pump placement in the well; method of purging, pumping rate, equipment and methods used to monitor field pH, temperature, and conductivity during purging, calibration of the field equipment, results of the field pH, temperature, conductivity and turbidity observations, well recovery time or rate (as applicable), and method of disposing of the purge water.

iii. A written discussion of the groundwater analyses indicating any change in the quality or characteristics of the groundwater.

iv. Type of pump used, pump placement for sampling, a detailed description of the sampling procedure; number and description of equipment, field and travel blanks; number and description of duplicate samples; type of sample containers and preservatives used, the date and time of sampling, the name and qualifications of the person actually taking the samples, and any other observations.

Chevron may refer to its most current Board staff–approved Groundwater Monitoring Program Standard Operating Procedures (SOP) plan for equipment and methods listed in items ii. and iv. that it uses consistently for each monitoring event. Any deviations from the SOP should be noted and explained in the SMR.

c. A comprehensive discussion of the compliance record and status, as well as any corrective actions taken or planned which may be needed to bring Chevron into full compliance with the Waste Discharge Requirements and Title 27, Chapter 3.

d. A map or aerial photograph shall accompany each report showing observation and monitoring station locations.

e. Laboratory statements of results of analyses specified in Part B must be included in each report. The director of the laboratory whose name appears on the laboratory certification shall supervise all analytical work in his/her laboratory and shall sign all reports of such work submitted to the Board.

i. The methods of analyses and detection limits must be appropriate for the expected concentrations, considering matrix specific instrument determinations (i.e. variable instruments, method detection levels (MDLs) and practical quantitative levels (PQLs)). If the analysis performed cannot achieve the values below the MACLs, Chevron shall supply an explanation in the semi-annual report. Analysis results not meeting the MACLs shall not be used for compliance determination unless there are values reported above the practical quantification limits. If methods other than EPA approved methods or Standard Methods are used, the exact methodology must be submitted for review and approved by the Executive Officer.

ii. In addition to the results of the analyses, laboratory quality assurance/quality control (QA/QC) information must be included in the monitoring report. The laboratory QA/QC information should include the method, equipment and analytical detection limits; the recovery rates; an explanation for any recovery rate that is less than the recovery acceptance limits specified in the USEPA method procedures or the laboratory's acceptance limits, if they are more stringent than those in the USEPA method procedures; the results of equipment and method blanks; the results of spiked and surrogate samples; the frequency of quality control analysis; and the name and qualifications of the person(s) performing the analyses.

f. The Annual Monitoring Report shall be submitted to the Board covering the previous monitoring year. The Report shall include, but is not limited to, the following:

i. A graphical presentation of the laboratory analytical data for each monitoring point for all samples taken. Each graph shall plot the concentration of one or more constituents over time for a given monitoring point, at a scale appropriate to show trends or variations in water quality.

ii. A tabular summary of all the monitoring data obtained during the previous year. The report should be accompanied by a $3^{1}/_{2\text{-inch}}$

computer data disk tabulating the year's data in MS Excel, MS Access, or other Board staff-approved format.

iii. A comprehensive discussion of the compliance record, and the corrective actions taken or planned which may be needed to bring the dischargers into full compliance with the waste discharge requirements.

iv. A written summary of the groundwater analyses indicating any change in the quality of the groundwater.

v. An evaluation of the effectiveness of the GPS monitoring/ control system in accordance with the requirements of Part B.1.

2. Contingency Reporting

a. Chevron shall report by telephone concerning **any seepage** from the surface of any waste management unit immediately after it is discovered. A written report shall be filed with the Board within seven days, containing at least the following information:

i. A map showing the location(s) of seepage;
ii. An estimate of the flow rate;
iii. A description of the nature of the discharge (e.g., all pertinent observations and analyses); and
iv. Corrective measures underway or proposed.

b. Following the determination that groundwater analytical results for a compliance monitoring location exceed the Maximum Allowable Concentration Limits (MACLs) listed in Table 2, Chevron shall evaluate QA/QC samples to determine if cross-contamination may have occurred. Chevron shall follow the procedures below for any monitoring locations still exceeding the MACLs:

i. Chevron shall immediately re-sample at the compliance point where the MACL was exceeded and re-analyze if results are not consistent with historical trends.
ii. If re-sampling and analysis confirm the exceedance of a MACL, Chevron shall document this in the text of the next Semi-Annual Monitoring Report and notify the Board in writing within 21 days of re-sampling. In this letter, the discharger shall evaluate whether any re-sampling or additional corrective measures need to be implemented.

3. Well Logs

A boring log and a monitoring well construction log shall be submitted for each new sampling well established for this monitoring program, as well as a report of inspection or certification that each well has been constructed in accordance with the construction standards of the Department of Water Resources. These shall be submitted within 45 days after the completion of well installation activities.

PART B: MONITORING AND OBSERVATION SCHEDULE

1. GPS PERFORMANCE MONITORING

Chevron shall measure the water level in each GPS corrective action monitoring well and in a sufficient number of wells or piezometers both upgradient and downgradient of the GPS to demonstrate continuous maintenance of a hydraulic depression in the GPS trenches (inward hydraulic gradient). To demonstrate the effectiveness of the GPS, Chevron shall include the following for each refinery sector in the semi-annual SMRs:

- contour maps of 1st and 3rd quarter GPS groundwater elevation data;
- hydrographs showing water level data (measured at least once per week) at each operating extraction sump or recovery well;
- a narrative summary of the GPS performance during the reporting period; and,
- an estimate of the volume of groundwater extracted during the reporting period.

2. ON-SITE OBSERVATIONS/POST-CLOSURE MAINTENANCE AND MONITORING

Closed waste management units (Plant 1/Additives Plant, Landfill 15, Landfarms 1-5, the Hydropits, Parr-Richmond Landfill and the Gertrude Street Site) shall be inspected annually by a registered California engineer or geologist prior to the onset of the rainy season. These annual inspections shall include identification of areas of the final covers where the soil has become eroded, attacked by rodents, or otherwise damaged, or where the paved areas have become damaged. Chevron shall perform appropriate repairs for these areas prior to the rainy season. In addition, Chevron shall monitor runoff/run-on control facilities for their effectiveness and overall condition as needed according to weather conditions during the winter months (November through April) and as prescribed in the approved post-closure maintenance/monitoring plan for each individual unit. Chevron shall maintain records of all inspections and repairs and summarize in each semi-annual monitoring report any repairs made during the corresponding reporting period.

3. ALKANE PLANT PLUME REMEDIATION MONITORING

Chevron shall continue to monitor the Alkane Plant Plume remediation effort according to the *Alkane Plant Plume Remediation Plan* (December, 1992). The monitoring components of this plan include measuring potentiometric water levels, liquid hydrocarbon thickness, and benzene and fluoride concentrations. Benzene and fluoride concentrations will continue to be measured annually in samples collected from 7 wells (listed in Table 1), located around the perimeter of the plume to verify containment of the plume.

4. S.P. HILL FREE-PHASE HYDROCARBON RECOVERYAND GROUNDWATER EXTRACTION SYSTEM MONITORING

Chevron shall continue to monitor groundwater remediation activities within the S.P. Hill Tankfield according to the *S.P. Hill Tankfield Free-Phase Hydrocarbon Recovery Facilities Installation and Startup Report and Remediation Monitoring Plan* (January, 1994). Monitoring components of this plan include: 1) monthly measurements of groundwater levels and hydrocarbon thickness in the recovery wells to confirm that pumps are set at correct elevations, 2) routine inspecting of pumps and controllers, piping, and temporary storage facilities; and 3) semi-annual monitoring of all the wells in the S.P. Hill Tankfield for free-phase liquid hydrocarbon.

5. FREE-PHASE LIQUID HYDROCARBON (FPLH) RECOVERY SUMMARY

Chevron shall include a map in each semi-annual SMR that shows the locations of all wells within the refinery that contain FPLH. The measured thickness of the FPLH in each well should be indicated on the map next to the well. In addition, the SMR shall include a description of FPLH recovery method/s used, recovery volume data for the reporting period and cumulative recovery data for each active recovery well or system.

6. CHEMICAL CONSTITUENT MONITORING

The discharger shall sample the compliance monitoring points listed in Table 1 for the analytical parameters and at the frequencies listed in Table 2. All monitoring activities, including analytical and QA/QC procedures will be conducted in accordance with the most recent version of Chevron's Groundwater Monitoring Program SOP.

Table 1. List of Monitoring Wells by Sector
Refinery-Wide Groundwater Monitoring Program
Chevron Richmond Refinery

Corrective Action									
GPS									
Alkane Sector	Castro and Plant 1/Add. Sector	Landfarms/Landfill 15 Sector	North Yard Sector	Reclamation Yard Sector	Pollard Sector	Effluent Sector	Bayside North	Bayside South	Interior "C" Zone
209A	323A	232A	178A	290A	260A	108A	387AT	346F	208C
460A	642A	233A	247A	643A	262A	164A	388AT	347F	638C
595AT	554A	234A	550A	370A	803A	179A	389F	348F	378C
223C	556A	240A	GPS-9A†	560A	635C	108C	390AT	349F	379C
375C	106C	244A	377C	109C		164C	391AT	351CT	380C
670C	125C	384A	178C	238C				345AT	138C
	320C	551A		369S				340AT	382C
167A*	649A	552A		564A				337F	
170A*		610A		569C				RW619AT#	
174A*		186C						RW534AT#	
200A*		104C							
201A*		232C							
258A*		234C							
		235C							
		236C							

Notes:

* Wells associated with Alkane Plant Plume Remediation Monitoring

Wells associated with Remediation Monitoring Plan, S.P. Hill Tankfield.

† GPS-9A is a proposed monitoring well

Table 2: Maximum Allowable Concentration Levels (MACLs) for Constituents of Concern and Monitoring Parameters for the Chevron Refinery Corrective Action Groundwater Monitoring Program

Constituents of Concern	MACL (µg/l unless otherwise noted)		Landfarms/Landfills Sector	Castro Sector	North Yard Sector	Bayside Sector – North	Bayside Sector – South	Alkane Sector	Effluent Sector	Reclamation Sector	Pollard Pond Landfill	Interior "C"-Zone
TPH-Gas	3.7 mg/l	c	X	X	X	X	X	X	X	X	X	X
TPH-Diesel	0.64 mg/l	c	X	X	X	X	X	X	X	X	X	X
Benzene	71	b[2]	X	X	X	X	X	X	X	X	/	X
MTBE	N/A	d	X	X	X	X	X	X	X	X	/	X
Acenaphthene	40	e	/	/	/	/	/	/	/	/	/	
Acenaphthylene	N/A	d	/	/	/	/	/	/	/	/	/	
Anthracene	110 mg/l	b[2]	/	/	/	/	/	/	/	/	/	
Benzo(a)pyrene	0.049	b[2]	/	/	/	/	/	/	/	/	/	
Benzo(b)fluoranthene	0.049	b[2]	/	/	/	/	/	/	/	/	/	
Benzo(g,h,I)perylene	N/A	d	/	/	/	/	/	/	/	/	/	
Benzo(k)fluoranthene	0.049	b[2]	/	/	/	/	/	/	/	/	/	
Chrysene	0.049	b[2]	/	/	/	/	/	/	/	/	/	
Dibenz(a,h)anthracene	0.049	b[2]	/	/	/	/	/	/	/	/	/	
Fluoranthene	370	b[2]	/	/	/	/	/	/	/	/	/	
Fluorene	14 mg/l	b[2]	/	/	/	/	/	/	/	/	/	
Indeno(1,2,3-cd)pyrene	0.049	b[2]	/	/	/	/	/	/	/	/	/	
Naphthalene	N/A	d	/	/	/	/	/	/	/	/	/	
Phenanthrene	N/A	d	/	/	/	/	/	/	/	/	/	
Pyrene	11 mg/l	b[2]	/	/	/	/	/	/	/	/	/	
Chlordane	0.00059	b[2]		/						/		
G-BHC (Lindane)	0.063	b[2]		/						/		
Dieldrin	0.14	b[2]		/						/		
Selenium	5.0	b[1]	/	/	/			X	/	/	/	
Arsenic	36	a	X	/					/	X		
Cadmium	9.3	a	/	/	/			/	/	/	X	/

Constituents of Concern	MACL (µg/l unless otherwise noted)		Landfarms/Landfills Sector	Castro Sector	North Yard Sector	Bayside Sector – North	Bayside Sector – South	Alkane Sector	Effluent Sector	Reclamation Sector	Pollard Pond Landfill	Interior "C"-Zone
Chromium VI	50	a	/	/	/			/	/	/	/	/
Lead	5.6	a	X	X	X	X	X	X	X	X		/
Mercury	0.025	a	/						/	/		
Nickel	8.2	b[1]	X	/	X			X	/	X	X	X
Zinc	71	b[1]	X	/	/			/	/	/	X	/
Fluoride	2.4 mg/l	f						X				
Un-ionized Ammonia-N	25	a							/	/		
pH	6.5 to 8.5	a	X	X	X	X	X	X	X	X	X	X
Turbidity (NTUs)	N/A	N/A	X	X	X	X	X	X	X	X	X	X
Temperature	N/A	N/A	X	X	X	X	X	X	X	X	X	X

X = Monitoring Parameter per Sector (analyzed semi-annually)
/ = Constituent of Concern per Sector [analyzed during summer/fall reporting period every 2 years (even-numbered years)]
a = San Francisco Bay Basin, Water Quality Control Plan (RWQCB 1995)
b = 40 CFR Part 131. *Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Proposed Rule.* August 1997.
[1] Criterion for Continuous Concentration (chronic toxicity)
[2] Human Health – consumption of aquatic organisms
c = Water quality goals used for redevelopment of San Francisco International Airport (RWQCB Order No. 99-045)
d = No state or federal numeric water quality criteria for toxicity to aquatic organisms have been promulgated
e = USEPA Ecotox Threshold, Final Chronic Value (1996)
f = Tentative value
N/A = Not applicable
(NTUs) = Nephelometric Turbidity Unit(s)

I, Lawrence P. Kolb, Acting Executive Officer, hereby certify that the foregoing Self-Monitoring and Reporting Program:

1. Has been developed in accordance with the procedures set forth in this Board's Resolution No. 73-16 in order to obtain data and document compliance with waste discharge requirements established in this Board's Order No. 00-043.

2. Is effective on the date shown below.

3. May be reviewed or modified at any time subsequent to the effective date, upon written notice from the Executive Officer.

Date Ordered: June 21, 2000

for Lawrence P. Kolb
Acting Executive Officer